1,101 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Readiness Center was measured between 0.0 ppm and 0.4 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Trak Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 42.1%, which was within the guideline of less than 65% recommended by ASHRAE.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

The average temperature inside the Readiness Center was 63.8 °F, which was below the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort. No complaints regarding indoor temperature were received by URS during this survey.

2.2.5 Lighting

Lighting in the Readiness Center was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot candles (FC) and the recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Conference Room, table	Admin	**32.2**	50
Admin, desk - Non-Responsive	Admin	**15.7**	50
Admin, desk - Non-Responsive	Admin	**26.3**	50
1st Sergeant's desk	Admin	**48.1**	50
Truckmaster Office, laptop workstation	Admin	**8.7**	50
Truckmaster Office, desktop workstation	Admin	**9.0**	50
Kitchen, counter	Break Room	**26.5**	50
Supply Office, workstation	Admin	**4.5**	50

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in nearly all of the office/administrative locations.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Feet ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Feet ($\mu g/ft^2$)
Commander's Office, floor at the base of flag	Hingham RC Wipe-01	0.108	**450**	200
Conference Room, top of refrigerator	Hingham RC Wipe-02	0.108	120	200
2nd floor classroom, floor against wall right of entrance	Hingham RC Wipe-03	0.108	**950**	200
Supply Room, stereo shelf	Hingham RC Wipe-04	0.108	**1,100**	200
Admin Office – Non-Responsive, top of black file cabinet	Hingham RC Wipe-05	0.108	140	200
Boiler Room, top of water heater	Hingham RC Wipe-06	0.108	**2,700**	200
Break Room/ Mess Hall, floor below posters	Hingham RC Wipe-07	0.108	**320**	200
Drill Hall, top of electric box	Hingham RC Wipe-08	0.108	**230**	200
Basement Storage corridor, floor outside of former Indoor Firing Range	Hingham RC Wipe-09	0.108	**1,100**	200
Locker Room, floor at base of SSG Non-Responsive locker	Hingham RC Wipe-10	0.108	**640**	200

Eight of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Four paint chip samples were collected from areas of peeling paint throughout the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Yellow paint, walls, locker room	**0.87**	0.5
Green paint, walls, unit room	0.39	0.5
White paint, ceiling, stairs to 2nd floor	0.35	0.5
Gray, floor, boiler room	**5.2**	0.5

On the day of the survey, two of the four paint chip samples were found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

No damaged, friable suspect material was identified during this survey for sample collection.

Presumed asbestos-containing floor tiles and associated mastic and pipe insulation were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Area noise dosimetry was conducted within the administrative office area. Area exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-4 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-4
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Office- SSG. [redacted]	Administrative	374	59.0	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included hard hats, safety glasses, ear plugs and nitrile gloves. No personal protective equipment was observed in use at the time of URS' site visit.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility.

3.2 Hearing Conservation

A written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site. Suspect asbestos-containing materials (ACM), including floor tile/mastic and pipe insulation were observed and must be considered to be presumed ACM until sampling

determines that they are not ACM. As presumed ACM, they must be managed through an asbestos O&M program.

3.7 Safety

The basement former Indoor Firing Range was posted as unsafe due to lead contamination but lacks the proper posting. No evidence was found that all fire extinguishers were being inspected on a monthly basis. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility. Walkways in storage areas were cluttered at the time of this survey. Chemicals were improperly stored in the boiler room. The stairway from outside to boiler room does not have handrails; planks used for bringing in supplies are unsafe.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program, 15 August 2003

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

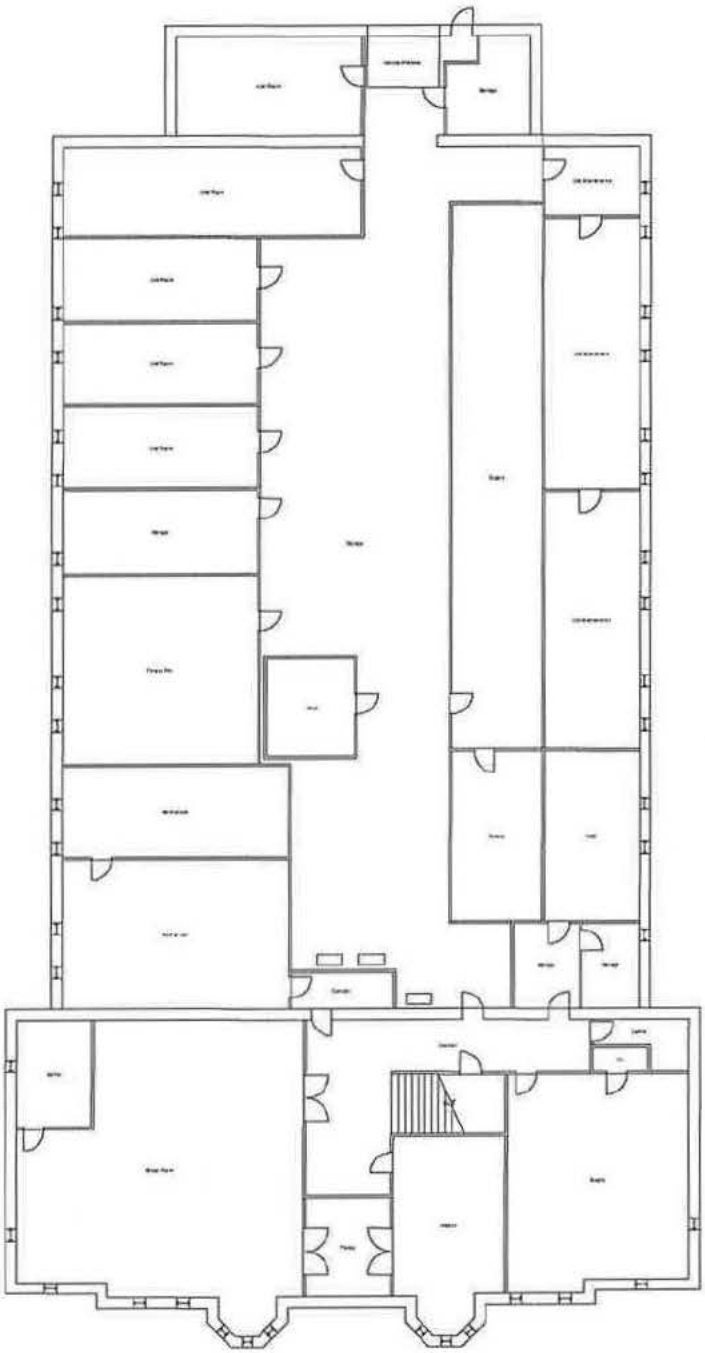
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

HINGHAM - 25B25
Basement Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS
CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

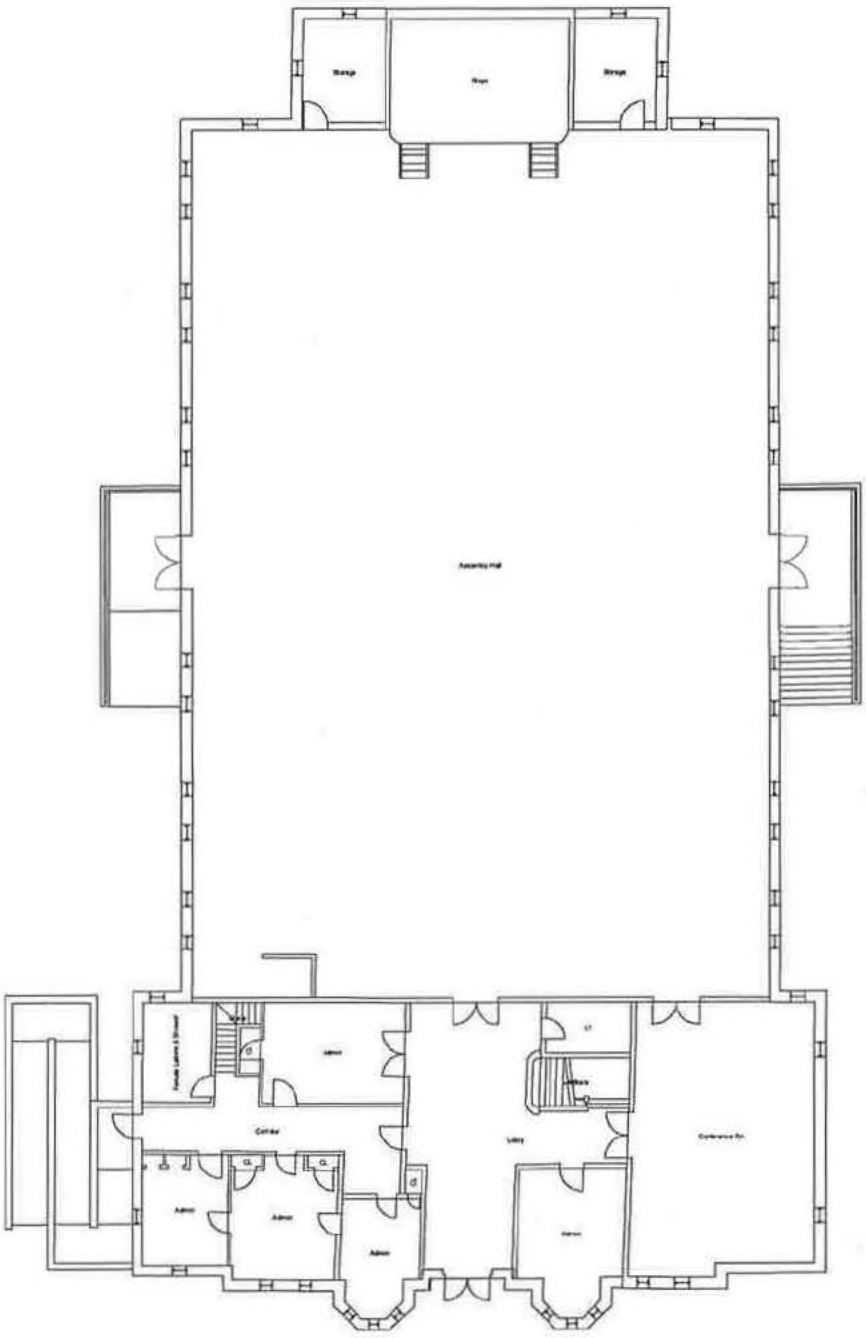
Massachusetts 1:200 NAD 83

William A. Cooney
Commonwealth of Massachusetts
Military Division
MAARNG-CFMO

Updated 7 March 2012

HINGHAM - 25B25
First Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS
CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

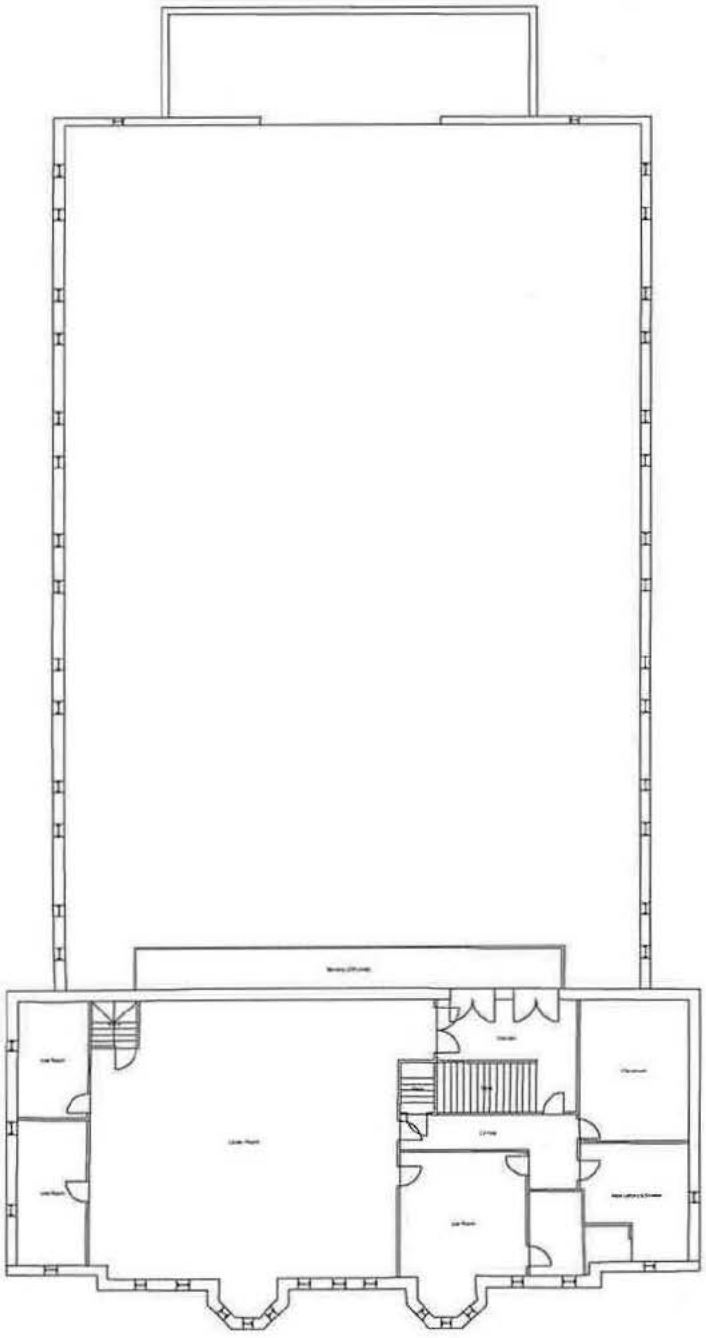
Massachusetts 1:200 NAD 83

William A. Cooley
Commonwealth of Massachusetts
Military Division
MAARNG-CFMO

Updated 7 March 2012

HINGHAM - 25B25
Second Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS
CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

Massachusetts 1:200 NAD 83

William A. Cooley
Commonwealth of Massachusetts
Military Division
NGMARNG-CFMO

Updated 7 March 2012

APPENDIX B

PERSONNEL LIST

1058TH TC FULL TIME STAFF

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515817
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	96 Central Street, Hingham, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hingham RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
13059867	HimghamRC Wipe 01	Flame	Wipe	****	0.108	110	ug/ft^2	49	450	ug/ft^2	
13059868	HimghamRC Wipe 02	Flame	Wipe	****	0.108	110	ug/ft^2	13	120	ug/ft^2	
13059869	HimghamRC Wipe 03	Flame	Wipe	****	0.108	110	ug/ft^2	100	950	ug/ft^2	
13059870	HimghamRC Wipe 04	Flame	Wipe	****	0.108	110	ug/ft^2	120	1100	ug/ft^2	
13059871	HimghamRC Wipe 05	Flame	Wipe	****	0.108	110	ug/ft^2	15	140	ug/ft^2	
13059872	HimghamRC Wipe 06	Flame	Wipe	****	0.108	110	ug/ft^2	290	2700	ug/ft^2	
13059873	HimghamRC Wipe 07	Flame	Wipe	****	0.108	110	ug/ft^2	34	320	ug/ft^2	
13059874	HimghamRC Wipe 08	Flame	Wipe	****	0.108	110	ug/ft^2	24	230	ug/ft^2	
13059875	HimghamRC Wipe 09	Flame	Wipe	****	0.108	110	ug/ft^2	120	1100	ug/ft^2	
13059876	HimghamRC Wipe 10	Flame	Wipe	****	0.108	110	ug/ft^2	69	640	ug/ft^2	
13059877	HimghamRC Wipe FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

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Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515817
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	96 Central Street, Hingham, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hingham RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13059878	HimghamRC LP 01	Flame	Paint Chip	****	N/A	0.011	%Pb		0.87	%Pb	
13059879	HimghamRC LP 02	Flame	Paint Chip	****	N/A	0.0078	%Pb		0.39	%Pb	
13059880	HimghamRC LP 03	Flame	Paint Chip	****	N/A	0.011	%Pb		0.35	%Pb	
13059881	HimghamRC LP 04	Flame	Paint Chip	****	N/A	0.0084	%Pb		5.2	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analyst: Non-Responsive

Technical Manage Non-Responsive

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) S15817

pg 1 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA IARNG
2. Job Location: 316 Central St, Hingham, MA
3. Job #: Hingham RC
4. Contact Pers
5. Submitted B

Non-Responsive

Non-Responsive

Reporting Information (Results will be provide

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☐ Results Required By Noon
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day + Date Due: 5/13/13	(Every Attempt Will Be Made to Accomodate)
Comments:	☐ 2 Day	

RE
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive .urs.com
☐ Fax: [redacted] @us.army.mil
☐ Verb @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)
☒ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Metals Analysis
☒ Pb Paint Chip 4 (QTY)
☒ Pb Dust Wipe (wipe type ghost) 11 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: ITEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Hingham RC wipe 01	admin	5/2/13		100 cm2				X				X				
Hingham RC wipe 02								X				X				
Hingham RC wipe 03								X				X				
Hingham RC wipe 04								X				X				
Hingham RC wipe 05								X				X				
Hingham RC wipe 06	maintenance							X				X				
Hingham RC wipe 07								X				X				
Hingham RC wipe 08								X				X				
Hingham RC wipe 09								X				X				
Hingham RC wipe 10								X				X				
Hingham RC wipe FB	Field Blank							X				X				
Hingham RC LP01	yellow locker wall							X			X					

Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Non-Responsive

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 5/10/13 @ Via: FedEx By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Date: / / Time:
4. Comments: 7940 0951 8920

(CUSTODY) Initials

pg 2 of 2

RMA Analytical Services, Inc.
Focused on Results www.rmalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 515817 pg 2 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
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5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA IARNG
2. Job Location: 96 Central St, Hingham, MA
3. Job #: Hingham RC
4. Contact Pers
5. Submitted b

Non-Responsive Non-Responsive

Reporting Information (Results will be provide

AFTER HOURS (must be pre-scheduled)
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ Immediate ☐ 3 Day
- ☐ Next Day ☒ 5 Day +
- ☐ 2 Day Date Due:
- ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
- ☐ Incl with Report
- ☐ Fax:
- ☐ Verb

Non-Responsive .us.com @us.army.mil @us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Quali PLM (Quan) PLM/TEM (Quali PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☒ Pb Paint Chip 4 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Mold Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
- ☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
- ☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
- ☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Hingham RC LP02	green-unit wall	5/2/13						X			X					
Hingham RC LP03	white-shortman	↓						X			X					
Hingham RC LP04	gray-basket floor	↓						X			X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Hingham RC	96 Central St., Hingham, MA	39743799

Photo No.	Date:
1	5/2/13

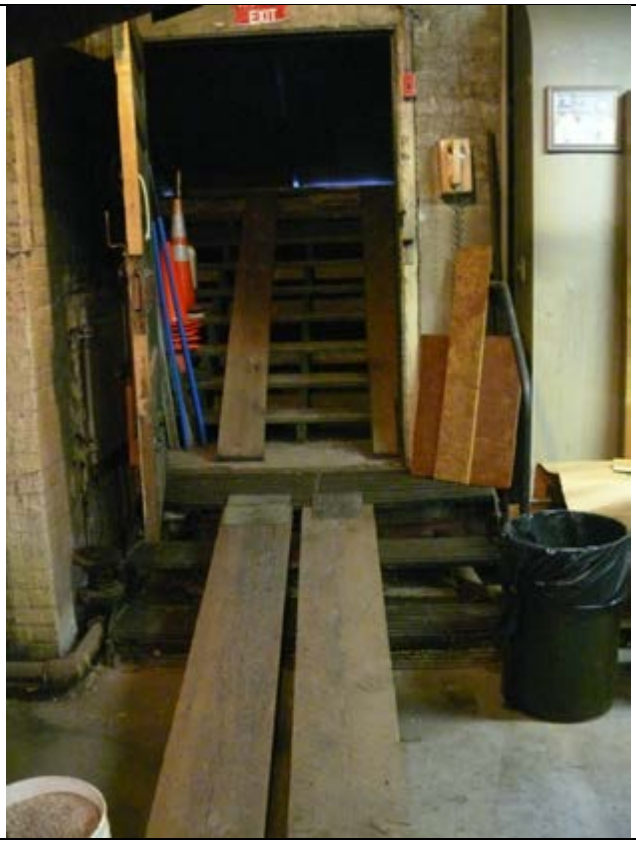
Description:

Ceiling damage as a result of water intrusion in 2nd floor classroom.

Photo No.	Date:
2	5/2/13

Description:

Stairs with no handrails at boiler room entrance from outside. Planks used for unloading supplies.



URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Hingham RC	96 Central St., Hingham, MA	39743799

Photo No.	Date:
3	5/2/13

Description:

Presumed asbestos containing pipe insulation above entrance to basement storage corridor.

Photo No.	Date:
4	5/2/13

Description:

Lack of adequate ventilation in kitchen in area over stove, which is regularly used. The kitchen is in the basement of the facility.

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 µg/ft^2 on floors and 250 µg/ft^2 on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
HUDSON READINESS CENTER
PARK STREET
HUDSON, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive — Office Manager

Non-Responsive — Project Manager

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS (Continued)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the former firing range and drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Splits and exposed ends of pipe insulation were found in a few places. Damage to some 9"x9" floor tile was also found in a few places.	Remove or repair the exposed pipe insulation. Remove the damage 9"x9" floor tile. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was available.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan was available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Mold		
Evidence of water incursions and visible mold growth were observed throughout the building.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located on Park Street in Hudson, Massachusetts 01749. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 26, 2004, Mr Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Hudson, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. All computer workstations had the correct type of ergonomic chairs and the keyboards could be adjusted. No issues were noted during the site visit concerning workstation ergonomics.

Water marks and damage were ob served on the ceilings and/or walls of mess hall # 1 (Photo # 4048); room # 14 (Photo # 4053); and room #28 (Photo # 4058). The main area of concern was in the mess hall where mold growth was observed.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 16.7 – 22.6% with an average of 17.7%. These readings were below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 373 to 466 parts per million (ppm), with an average of 382 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and

motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 382 ppm on the day of the survey, the ASHRAE limit would be 1082 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 ppm throughout the survey period. The measured level was below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (foot candles)	Recommended Minimum Illuminance (foot candles)
Office # 14	Administrative Duties	14	50
Office # 15	Administrative Duties	17	50
Office # 16	Administrative Duties	10	50
Office # 17	Administrative Duties	19	50
Office # 18	Administrative Duties	22	50
Office # 20	Administrative Duties	20	3
Hallway # 13	Accessway	9	3
Hallway # 22	Accessway	12	3
Hallway # 29	Accessway	7	3

On the day of the survey the illuminance in the administrative area was inadequate in all of the offices.

2.2.5 Lead

Five paint chip samples were collected where paint was peeling and sent to AMA Analytical Services, Inc. for analysis. The samples were found to contain lead in a concentration below the allowable limit of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room # 9D	0226-LPC04	0.01	0.14
Hallway # 13	0226-LPC05	0.01	0.21
Hallway # 13	0226-LPC06	0.01	0.22
Stairs: basement to 1st Floor	0226-LPC07	0.01	0.018
Room # 15	0226-LPC08	0.01	0.028

The analytical report from AMA is contained in Appendix D.

URS collected lead wipe samples in this area, in accordance with the Army National Guard statement of work. Analytical results from these samples will be provided in a supplemental letter.

2.2.6 Asbestos

ATC Associates of Woburn, Massachusetts conducted an asbestos survey at this facility in May of 1999 to confirm the types, quantities and locations of asbestos on site. Damage to the asbestos-containing 9"x9" floor tile was found in Kitchen # 3 (Photo # 4049), room # 14 (Photo # 4054), area # 22B (Photo # 4055) and area #22D (Photo # 4056). Splits in the asbestos-containing pipe insulation were found in the mess hall # 1 (Photo # 4047) and in supply room # 4 (Photo # 4051).

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices. URS recommends increasing lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: The five paint chips tested in this area for lead were found to be within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines.

MOLD: The water stains and damage on the ceilings and/or walls could lead to larger mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Top of a Light Guard	0226-LW06	0.111	3,900	200
Former Firing Range-Top of a Table	0226-LW07	0.111	150	200
Former Firing Range-Floor – Rear	0226-LW08	0.111	1,400	200
Former Firing Range-Floor – Center	0226-LW09	0.111	270	200
Former Firing Range-Floor – Front	0226-LW10	0.111	430	200
Blank	0226-LWBlank	N/A	0.57	200

One air sample for lead dust was collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0226-LA01	1068	<2.8	50.0
Blank	0226-LA03	N/A	<3.0 µg	N/A

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

Paint chips were collected in the former firing range where paint was peeling and sent to AMA for analysis. The samples were found to contain lead in a concentration below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 3-3 below shows the results of the lead paint testing.

Table 3-3
Levels of Lead in Paint Found in the Former Firing Range

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Former Firing Range	0226-LPC01	0.01	0.1
Former Firing Range	0226-LPC02	0.01	0.19
Former Firing Range	0226-LPC03	0.01	0.096

The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: All five surface wipe samples collected in the former firing range were found to contain lead dust levels which exceeded the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office. The paint chip samples were found to contain lead within the allowable limits. URS recommends that an appropriately licensed lead contractor clean the former firing range of the lead dust. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Appendix H contains guidelines for the cleanup and rehabilitation of indoor firing ranges.

ASBESTOS: Exposed aircell pipe insulation was found in the former firing range (Photo # 4046).

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 9,680 square foot area used for assembling personnel and storing equipment. The walls are constructed of brick with a wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Seat of a Bench	0226-LW01	0.111	19	200
Drill Hall – Top of a Snack Machine	0226-LW02	0.111	160	200
Drill Hall – Stage Floor	0226-LW03	0.111	62	200
Drill Hall – Floor – Center	0226-LW04	0.111	71	200
Drill Hall – Floor – Front	0226-LW05	0.111	230	200
Blank	0226-LWBlank	N/A	0.57	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0226-LA02	952	<3.2	50.0
Blank	0226-LA03	N/A	<3.0 µg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: One surface wipe sample taken in this area for lead was found to be above the allowable limits. The area needs to be cleaned by a personnel trained in accordance with the OSHA Lead Standards. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

5.0 BOILER ROOM / BASEMENT AREA

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

Asbestos in the boiler room had previously been abated when a new furnace was installed.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

No issues were observed in this portion of the building.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined space program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required on site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

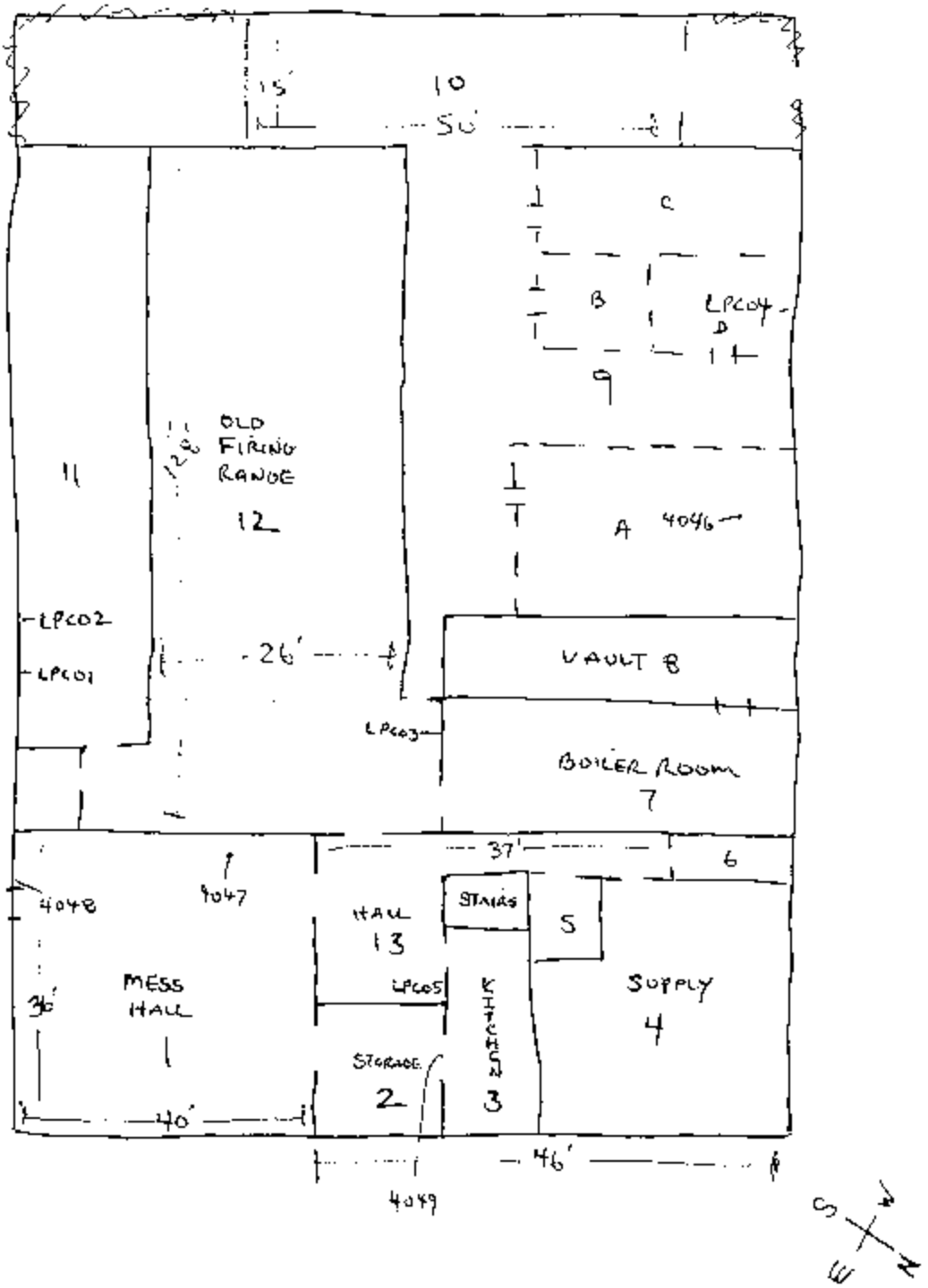
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

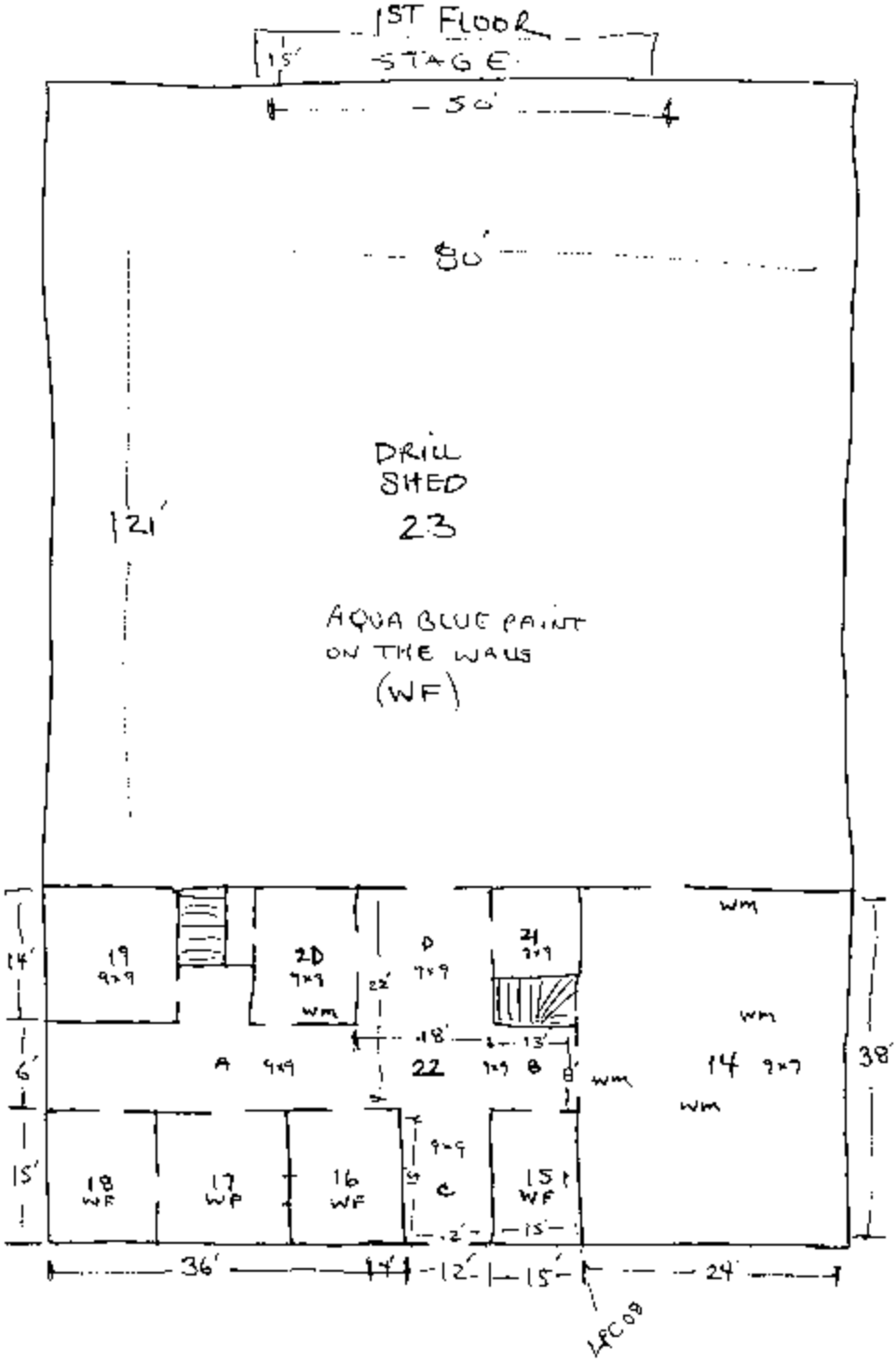
APPENDIX A

READINESS CENTER DRAWING

BASEMENT



FRONT


1ST FLOOR
15'
STAGE
50'
80'
DRILL SHED
23
21'
AQUA BLUE PAINT ON THE WALLS (WF)
19 9x9
20 9x9
wm
D 9x9
21 9x9
22'
18'
13'
A 9x9
22
9x9 B
8'
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14 9x7
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14'
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15'
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18 WF
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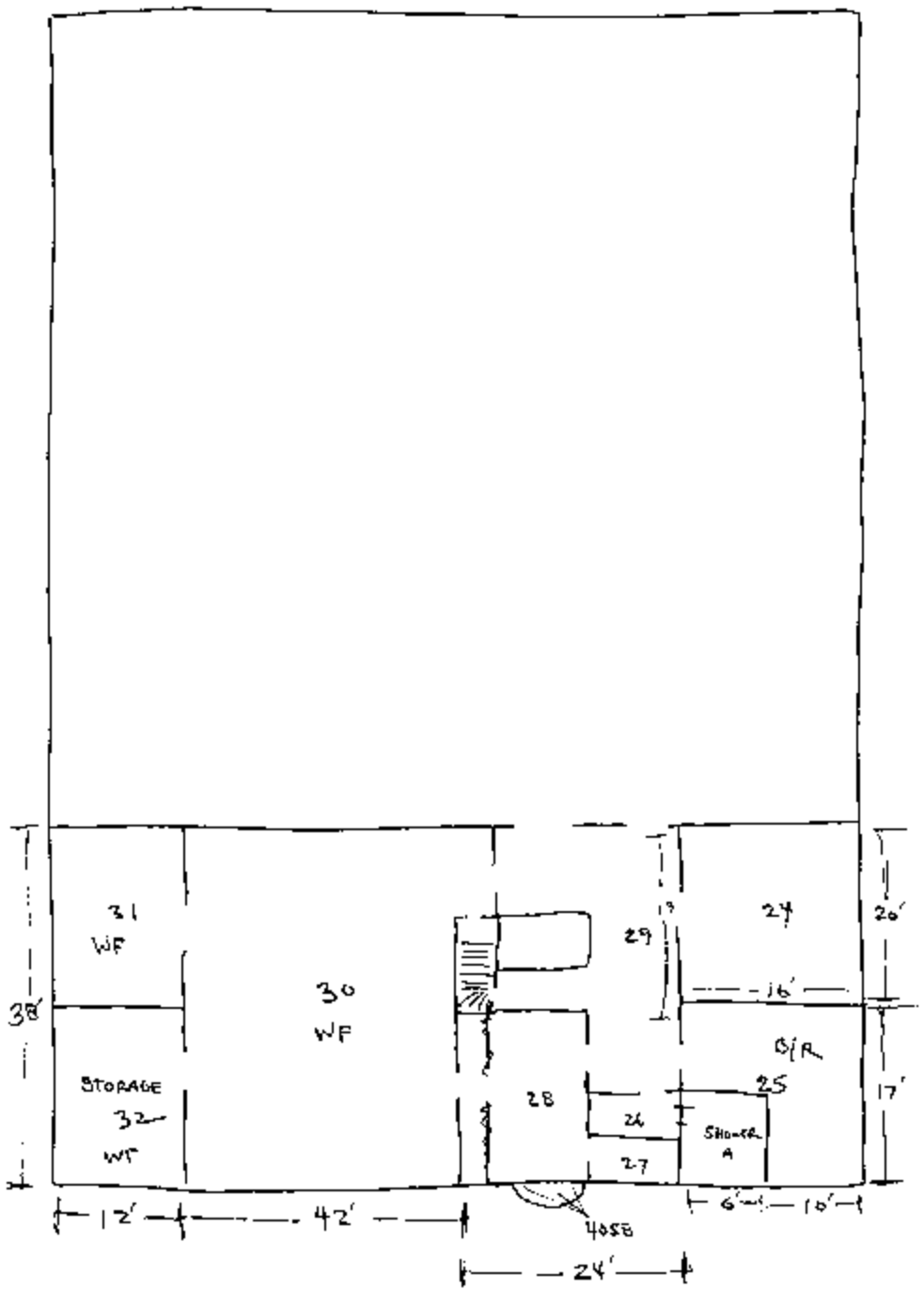
16 WF
9x9 C
15 WF
2'
15'
36'
14'
12'
15'
24'
LFCOB
FRONT
WM = WATER MARKS.
WF = WOOD FLOOR


31
WF
30
WF
STORAGE
32
WF
38'
29
19
24
26'
16'
O/R
25
28
26
27
SHOWER
A
17'
12'
42'
40SB
6'
10'
24'

APPENDIX B

PERSONNEL LIST

PERSONEL LIST
HUDSON ARMORY

	Non-Responsive	Rank
		SFC
		SSG

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123987
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Park Street; Hudson, MA	**Date Analyzed:**	03/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	07-Apr-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0432307	0226-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.1	%Pb	
0432308	0226-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.19	%Pb	
0432309	0226-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	0.096	%Pb	
0432310	0226-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	0.14	%Pb	
0432311	0226-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.21	%Pb	
0432312	0226-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.22	%Pb	
0432313	0226-LPC 07	Flame	Paint Chip	****	N/A	0.01	%Pb	0.018	%Pb	
0432314	0226-LPC 08	Flame	Paint Chip	****	N/A	0.01	%Pb	0.028	%Pb	
0432315	0226-LW 01	Furnace	Wipe	****	0.111	2.70	ug/ft^2	19	ug/ft^2	
0432316	0226-LW 02	Furnace	Wipe	****	0.111	33.75	ug/ft^2	160	ug/ft^2	
0432317	0226-LW 03	Furnace	Wipe	****	0.111	13.50	ug/ft^2	62	ug/ft^2	
0432318	0226-LW 04	Furnace	Wipe	****	0.111	13.50	ug/ft^2	71	ug/ft^2	
0432319	0226-LW 05	Furnace	Wipe	****	0.111	33.75	ug/ft^2	230	ug/ft^2	
0432320	0226-LW 06	Flame	Wipe	****	0.111	108.01	ug/ft^2	3900	ug/ft^2	
0432321	0226-LW 07	Furnace	Wipe	****	0.111	33.75	ug/ft^2	150	ug/ft^2	
0432322	0226-LW 08	Flame	Wipe	****	0.111	108.01	ug/ft^2	1400	ug/ft^2	
0432323	0226-LW 09	Flame	Wipe	****	0.111	108.01	ug/ft^2	270	ug/ft^2	
0432324	0226-LW 10	Flame	Wipe	****	0.111	108.01	ug/ft^2	430	ug/ft^2	
0432325	0226-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30	ug	0.57	ug	
0432326	0226-LA 01	Flame	Air	1068	N/A	2.81	ug/m^3	< 2.8	ug/m^3	

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123987
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Park Street; Hudson, MA	**Date Analyzed:**	03/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	07-Apr-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0432327	0226-LA 02	Flame	Air	952	N/A	3.15	ug/m³	<	3.2	ug/m³	
0432328	0226-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

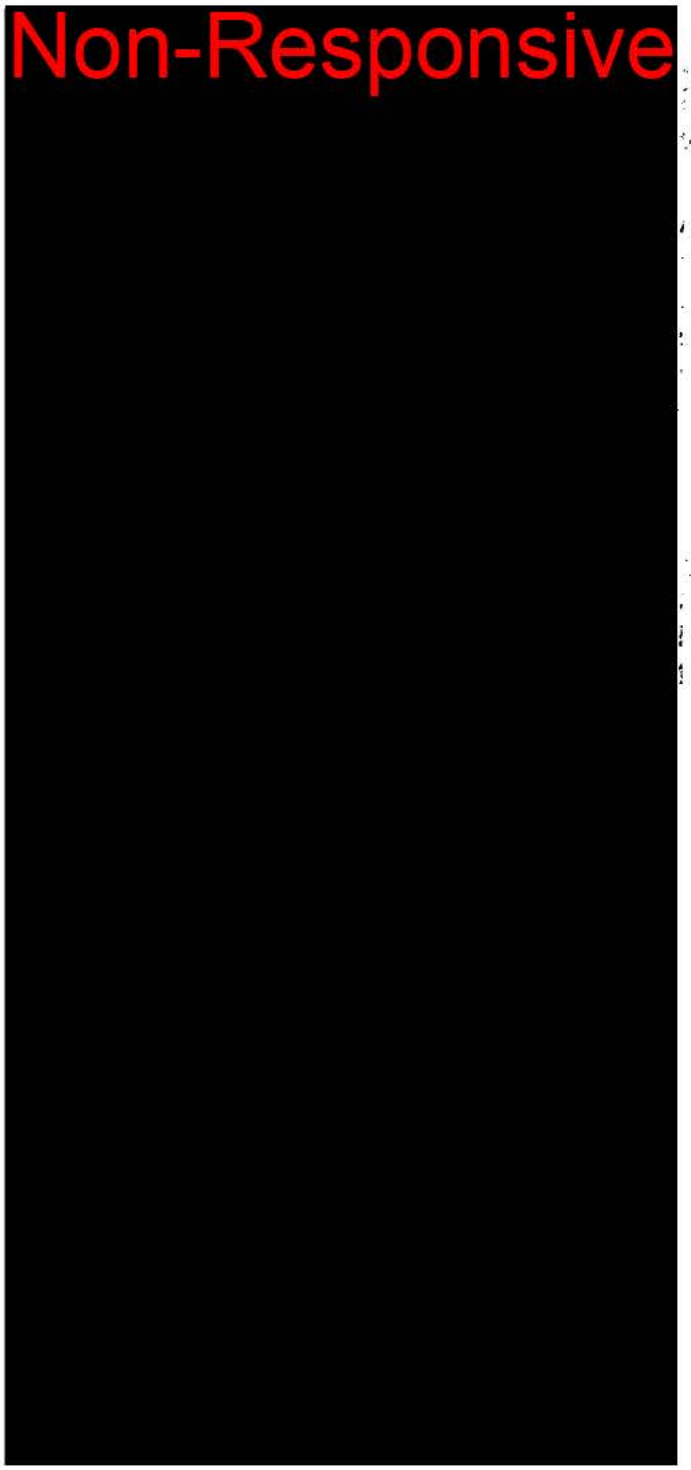
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive

nical Manager: [redacted] Non-Responsive

APPENDIX E

TRAINING CERTIFICATES



INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
President/Director of Training

APPENDIX F

PHOTOGRAPHS

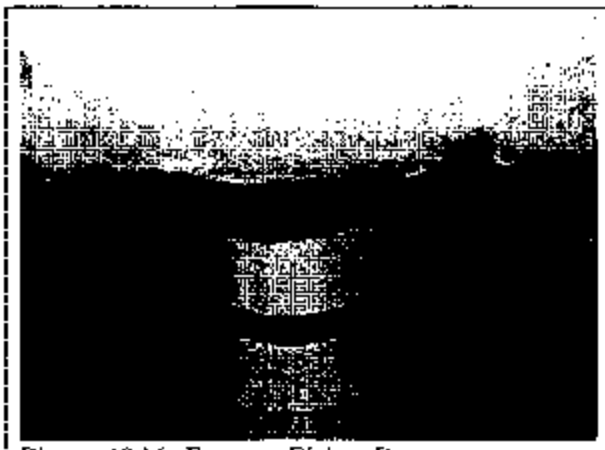


Photo 4046: Former Firing Range – Damaged asbestos-containing pipe insulation

Photo 4047: Mess Hall #11 – Damaged asbestos-containing pipe insulation

Photo 4048: Mess Hall #14 – Water damaged plaster wall with visible mold

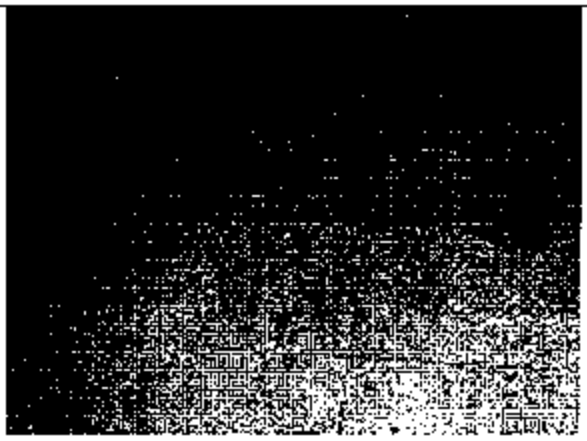


Photo 4049: Kitchen #3 – Damaged asbestos-containing floor tile

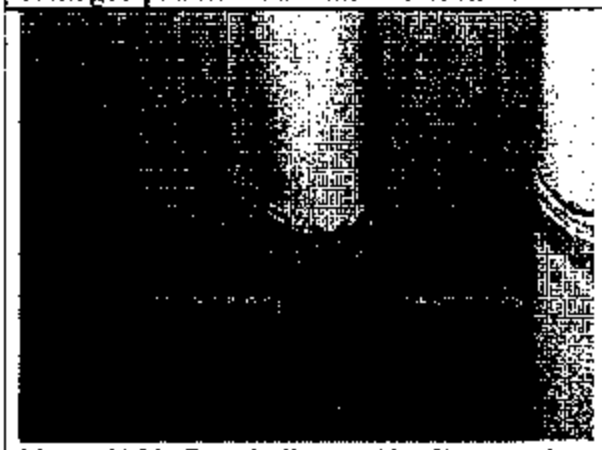


Photo 4051: Supply Room #4 – Damaged asbestos-containing pipe insulation

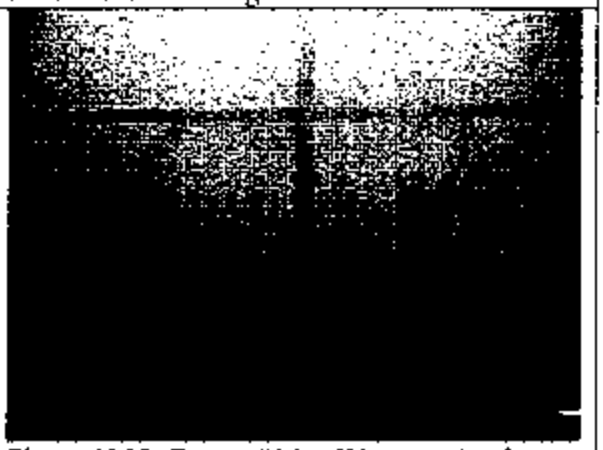


Photo 4053: Room #14 – Water stained ceiling tiles

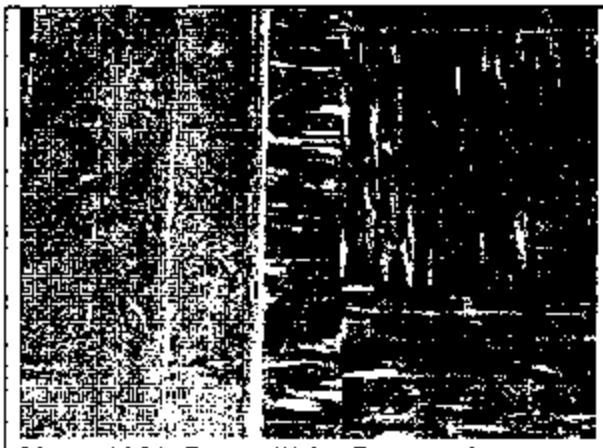


Photo 4054: Room #14 - Damaged asbestos-containing floor tile

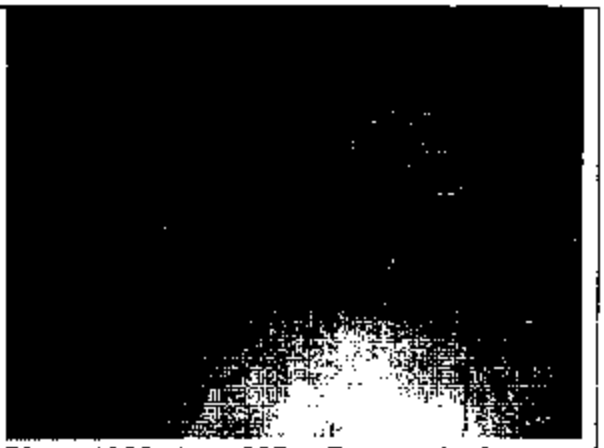


Photo 4055: Area 22B – Damaged asbestos-containing floor tile

Photo 4056: Area 22D – Damaged asbestos-containing floor tile

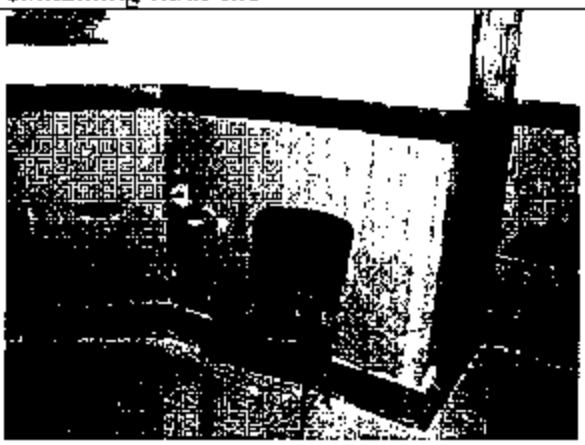


Photo 4058: Room #28 – Water damaged walls

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air semples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
- a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program)
- b. AR 11-34 (The Army Respiratory Protection Program).
- c. AR 40-5 (Preventive Medicine).
- d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges)
- e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
- f. OSHA Technical Manual, Edition VII.
- g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter [illegible] Whatman 42 filter paper

BEST AVAILABLE COPY

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

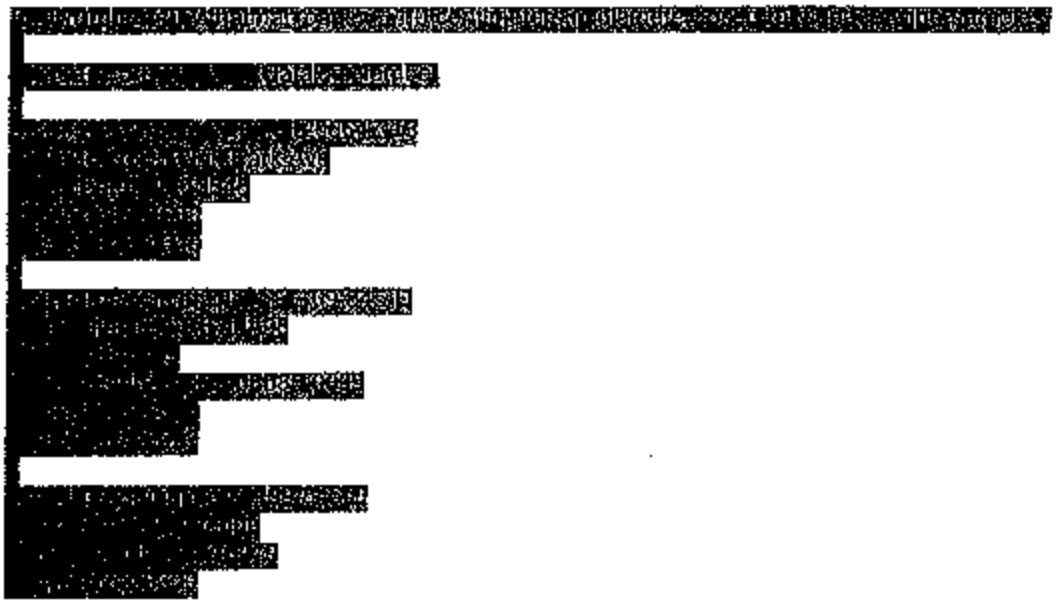
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft -- Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address	Point of Contact *(name & phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	Date Collected	Date Shipped

Analysis Desired

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection

Analysis Desired

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer

Comments to Lab:

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

Prepared for:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
Havre De Grace, Maryland




Industrial Hygiene Survey
for MAARNG – Hudson Readiness Center
1 Park Street
Hudson, Massachusetts 01749

AECOM Environment
October 2010
Document No.: 60159721/Hudson Readiness Center

Prepared for:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
Havre De Grace, Maryland

Industrial Hygiene Survey
for MAARNG – Hudson Readiness Center
1 Park Street
Hudson, Massachusetts 01749

Non-Responsive

Industrial Hygienist

Non-Responsive

Project Manager

Non-Responsive

Northeast District Health & Safety Manager

AECOM Environment
October 2010
Document No.: 60159721/Hudson Readiness Center

Contents

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Executive Summary

On August 16, 2010, AECOM Environment conducted an Industrial Hygiene (IH) survey of the Hudson Readiness Center facility located at the 1 Park Street in Hudson, Massachusetts. SSG Non-Responsive was the point of contact for the facility and accompanied AECOM during the survey to provide access and information concerning the Hudson Readiness Center operations.

The industrial hygiene survey was generally conducted in accordance with the scope of work as described in the "Statement of Work – Industrial Hygiene Services for National Guard Bureau Industrial Hygiene Region North – Baseline Surveys for Readiness Centers and Administrative Buildings", dated March 2009.

The Hudson Readiness Center is currently staffed by approximately six personnel. The facility is configured as an administrative area and a Drill/Assembly Hall.

Personnel at the facility were undertaking normal daily activities, which are administrative in nature, at the time of the survey.

The activities undertaken during the Industrial Hygiene survey included facility descriptions, lead wipe/air sampling, evaluation of housekeeping, illumination studies, ventilation system evaluation, and a review of the physical building condition.

The Hudson Readiness Center is housed in a three story masonry building, consisting of approximately 60% administrative space and 40% drill hall.

Lighting levels measured throughout the facility were generally inadequate as per ANSI/IESNA RP-1-2004, Office Lighting, ANSI/IESNA RP-7-2001, Industrial Lighting, and the IESNA Lighting Handbook, 9th Edition, 11 April 2005.

Wipe samples collected throughout the facility generally indicated lead levels below the ARNG action level. However, wipe samples collected in the former firing range indicated levels of lead in excess of the ARNG action level.

Water damaged ceiling tiles were observed in Classroom #2 and Classroom #1.

The HVAC system in the building consists of a boiler room that feeds radiant heaters throughout the building. There is no HVAC system that provides fresh air from the building exterior in administrative areas.

1.0 Facility Description and Operations

The Hudson Readiness Center is a 3 story administrative facility within a masonry structure. The building consists of two main sections. The east 3 story section of the building contains office and administrative areas, and is finished with painted block, plaster, and glazed block walls; acoustical drop ceilings, and floor tile. The drill hall comprises the south portion of the building. This area is finished with painted block walls, an exposed roof deck painted to match the walls, and hardwood floors.

The primary activity at the Hudson Readiness Center is routine administrative duties and occasional use by units for support and training of soldiers. The Hudson Readiness Center is currently staffed by approximately 6 personnel. No vehicle maintenance activities are undertaken at the facility.

2.0 Sampling in Readiness Centers

2.1.1 Wipe Sampling

Wipe sampling for lead was conducted in the former firing range, the drill hall, and the administrative areas following the OSHA wipe sampling method and using Ghost wipes. According to site personnel the rifle range was abated on August 30, 2000. Samples were collected in areas that are not frequently cleaned and showed signs of dust whenever possible.

The following table presents the results of the lead wipe sampling conducted at the facility.

Table 2-1: Lead Wipe Sample Results

Sample Number	Sample Location	Lead Concentration
HURC – 1	Bullet Trap	150 ug/ft^2
HURC – 2	Range Light	1,100 ug/ft^2
HURC – 3	Range Floor	250 ug/ft^2
HURC – 4	Folding Chair in Range	<110 ug/ft^2
HURC – 5	Outside Range on Floor	700 ug/ft^2
HURC – 6	Drill Hall Floor	<110 ug/ft^2
HURC – 7	Drill Hall Cabinet	<110 ug/ft^2
HURC – 8	Drill Hall Stage Floor	<110 ug/ft^2
HURC – 9	Classroom Desk	<110 ug/ft^2
HURC – 10	Mess Hall Table	<110 ug/ft^2
HURC – 11	Kitchen Counter	<110 ug/ft^2
HURC – 12	Classroom 2 Table	<110 ug/ft^2

The wipe sample collected on top of a light fixture in the range, on the floor of the range, and on the floor outside the range detected levels of lead in excess of the ARNG action level of 200 ug/ft^2. Laboratory analytical results are presented in Appendix C.

2.1.2 Air Sampling

Ambient air sampling for lead was conducted in two normally occupied areas of the facility.

Table 2-2: Lead Air Sample Results

Sample Number	Sample Location	Lead Concentration
HRC-10	Drill Hall	<17 ug/m^3
HRC-11	Orderly Room	<17 ug/m^3

None of the air samples collected indicated the presence of airborne lead above detectable limits. For reference, the OSHA Action Level for lead is 30 ug/m^3 and the Permissible Exposure Limit (PEL) is 50 ug/m^3. Laboratory analytical results are presented in Appendix C.

3.0 Physical Condition of Facility and Personnel Concerns

3.1.1 Lead Based Paint

Interior surfaces of walls are coated with paint. The paint on the walls appeared to be generally in good condition. Concrete flooring was generally tiled or unpainted. AECOM did not observe damaged or peeling paint during this evaluation.

3.1.2 Suspect Asbestos Containing Materials

AECOM did not observe damaged, friable suspect asbestos containing materials (ACM) in readily accessible areas of the Hudson Readiness Center during this survey. Thermal system piping is typically covered in ACM or fiberglass insulation with associated fittings in good condition.

Facility personnel provided AECOM with an Asbestos Containing Materials Building Survey as well as documentation of an abatement project undertaken at the facility at the time of the IH survey.

Other typical miscellaneous building materials observed but not sampled include floor tiles and associated mastic, cove base and associated mastic, ceiling tiles, and window glazing compound and caulks.

3.1.3 Water Damage/Mold

AECOM observed evidence of water intrusion in Classroom #1 and Classroom #2 during this survey. According to site personnel the water leak has been fixed. Water intrusion is a mold growth risk factor.

3.1.4 Housekeeping

The Hudson Readiness Center was observed to be generally clean and orderly during this assessment. AECOM did not observe dust accumulation on readily accessible horizontal surfaces within areas commonly used in the facility.

3.1.5 Indoor Air Quality/ Ergonomics

The Administration Section contains general office space. The Administration Section is generally utilized by all of the Hudson Readiness Center staff members. No Indoor Air Quality concerns were noted by the Hudson Readiness Center personnel.

Instantaneous real-time reading for carbon monoxide, carbon dioxide, temperature, and relative humidity are presented in the following table. Temperature in classroom #2 was slightly elevated.

Table 3-1: Indoor Air Quality Monitoring Results

Location	Carbon Monoxide (ppm)	Carbon Dioxide (ppm)	Temp (°F)	Relative Humidity (%)
Exterior – Baseline	1.7	399	80.1	64.8
Classroom #2	1.0	526	79.7	57.7
Classroom #1	1.2	540	78.1	58.2
Mess Hall	1.3	538	75.4	61.4
Table 1-3 Guidelines: Carbon Monoxide: Office/Warehouse Space – 9 ppm based on EPA National Ambient Air Quality Standard.				

Location	Carbon Monoxide (ppm)	Carbon Dioxide (ppm)	Temp (^{o}F)	Relative Humidity (%)
OSHA Permissible Exposure Limit (PEL) = 50 ppm. ACGIH Threshold Limit value (TLV) = 25, ppm. Carbon Dioxide: Office Space -Approximately 700 ppm above background (Derived from ASHRAE Standard 62.1-2007). Not Applicable to warehouse and vehicle maintenance bays. Relative Humidity: Mechanically air-conditioned space – Maximum 65% (Derived from ASHRAE Standard 62.1-2007 – 5.10.1). Temperature: Winter (clothing insulation = 1.0 clo) Relative humidity 30-60% - Temp - 68 – 75°F Summer Temp - 73 – 79°F. (Derived from ASHRAE Standard 55-2004)				

Hudson Readiness Center personnel did not report any ergonomics issues or concerns. Office furniture and accessories designed to promote ergonomically correct behaviors were observed.

4.0 Ventilation and HVAC System

4.1.1 Ventilation Systems and Potential for Contamination of Clean Air Sources

Potential for contamination of clean air sources was not observed in the facility.

The Hudson Readiness Center is heated by a radiant heating system fed by a boiler located in the boiler room that is adjacent to the drill hall. Supply and return air is not provided by mechanical means. Outdoor air is provided in the building through open windows and doors.

4.1.2 HVAC Maintenance

There was no active ventilation system.

5.0 Lighting

Lighting levels in all areas were measured utilizing a Cal-Light 400 light meter that displays lighting levels in foot-candles. Lighting levels were inadequate in most areas.

Table 5-1: Light Survey

Location	Results – (Foot candles)	Met Standard (Y/N)	Standard*
Classroom #2	21.7	N	30
JISCC Room	14.0	N	30
Male Latrine	35.1	Y	5
Male Shower	33.0	Y	5
Computer Room	32.6	Y	30
Main Entrance	15.8	Y	10
Classroom #1	15.0	N	30
Armor's Office	8.4	N	50
Readiness Office	15.2	N	50
SIG Office #1	16.8	N	50
SIG Office #2	29.5	N	50
SIG Office #3	29.3	N	50
SIG Office #4	30.0	N	50
Women's Latrine	15.8	Y	5
Copier/Fax Room	3.6	N	10
D/1-181 IN Supply Room	32.2	Y	5
NBC Room	36.6	Y	30
Drill Hall	40.6	Y	10
Mess Hall	35.1	Y	10
Kitchen	40.3	N	50
Supply Room	43.1	Y	5
Boiler Room	19.2	N	30
Arms Vault	36.1	Y	10
Section Room 1	4.6	N	5
Section Room 2	6.5	Y	5
Section Room 3	7.0	Y	5
Office Lighting (ANSI/IESNA RP-1-04) and Industrial Lighting Facilities (ANSI RP-7-01)			

6.0 Evaluation of Attached Garage

There is no garage associated with the Hudson Readiness Center.

7.0 Conclusions and Limitations

AECOM has conducted this survey in accordance with applicable OSHA methods and standard industrial hygiene practice. The following conclusions were based on the observations and assessments of activities that occurred during the on-site evaluation:

Housekeeping is performed regularly at the Hudson Readiness Center, and AECOM did not observe any damaged, suspect asbestos containing materials or peeling paint during the evaluation.

Evidence of water intrusion was observed in the Orderly Room, corridor, and supply room. Water intrusion is a mold growth risk factor.

Lighting levels in most areas were not in compliance with ANSI/IESNA guideline levels.

Air samples collected and analyzed did not indicate quantifiable levels of airborne lead.

Wipe samples collected in various administrative locations throughout the building did not indicate levels of lead on surfaces in excess of the ARNG action level.

Wipe samples collected in association with the former firing range indicated levels of lead on surfaces in excess of the ARNG action level

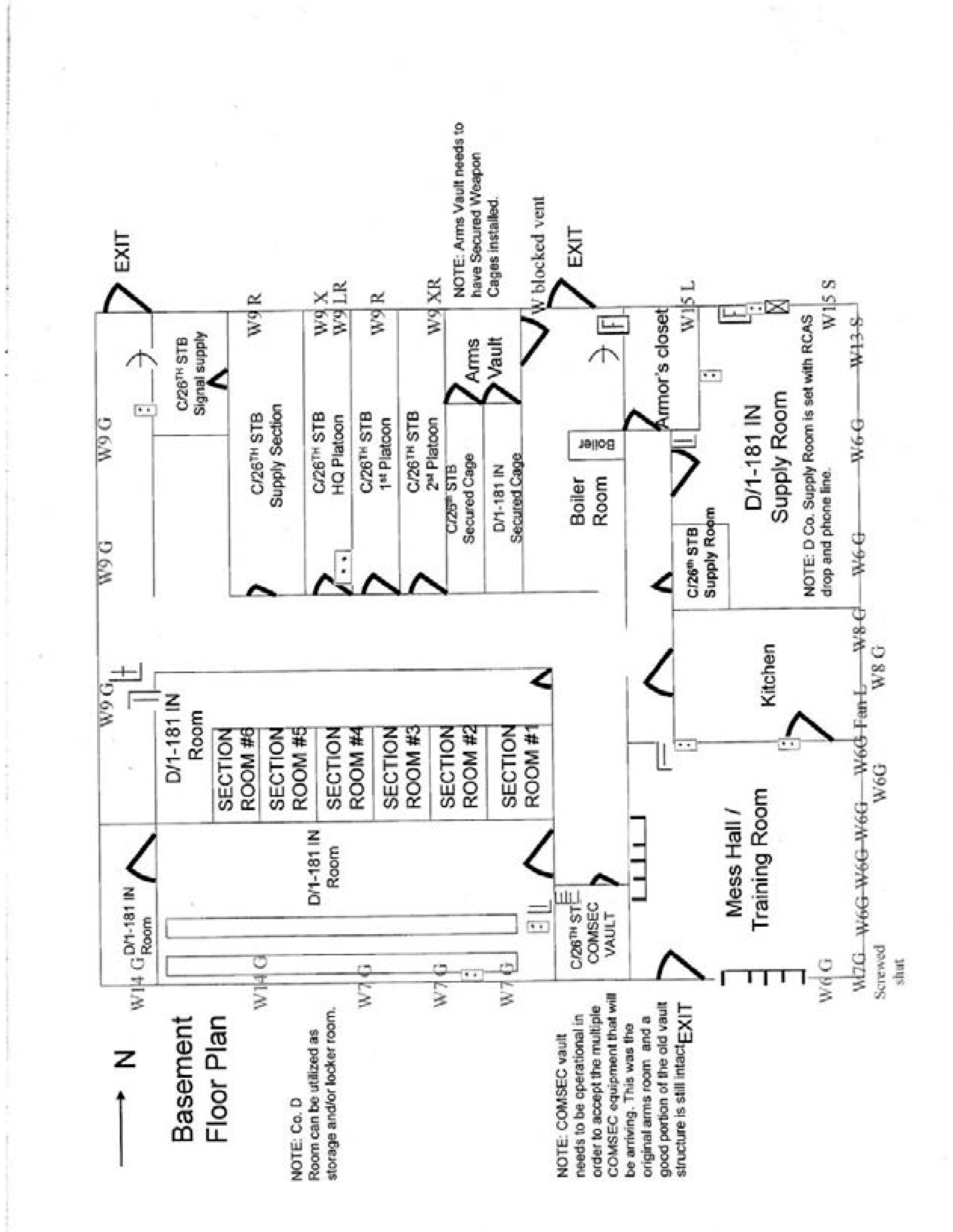
AECOM provided these services consistent with the level and skill ordinarily exercised by members of the profession currently providing similar services under similar circumstances at the time the services were provided. This statement is in lieu of other statements either expressed or implied. This report is intended for the sole use of National Guard Bureau – Army National Guard. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document, the findings, conclusions, or recommendations is at the risk of said user.

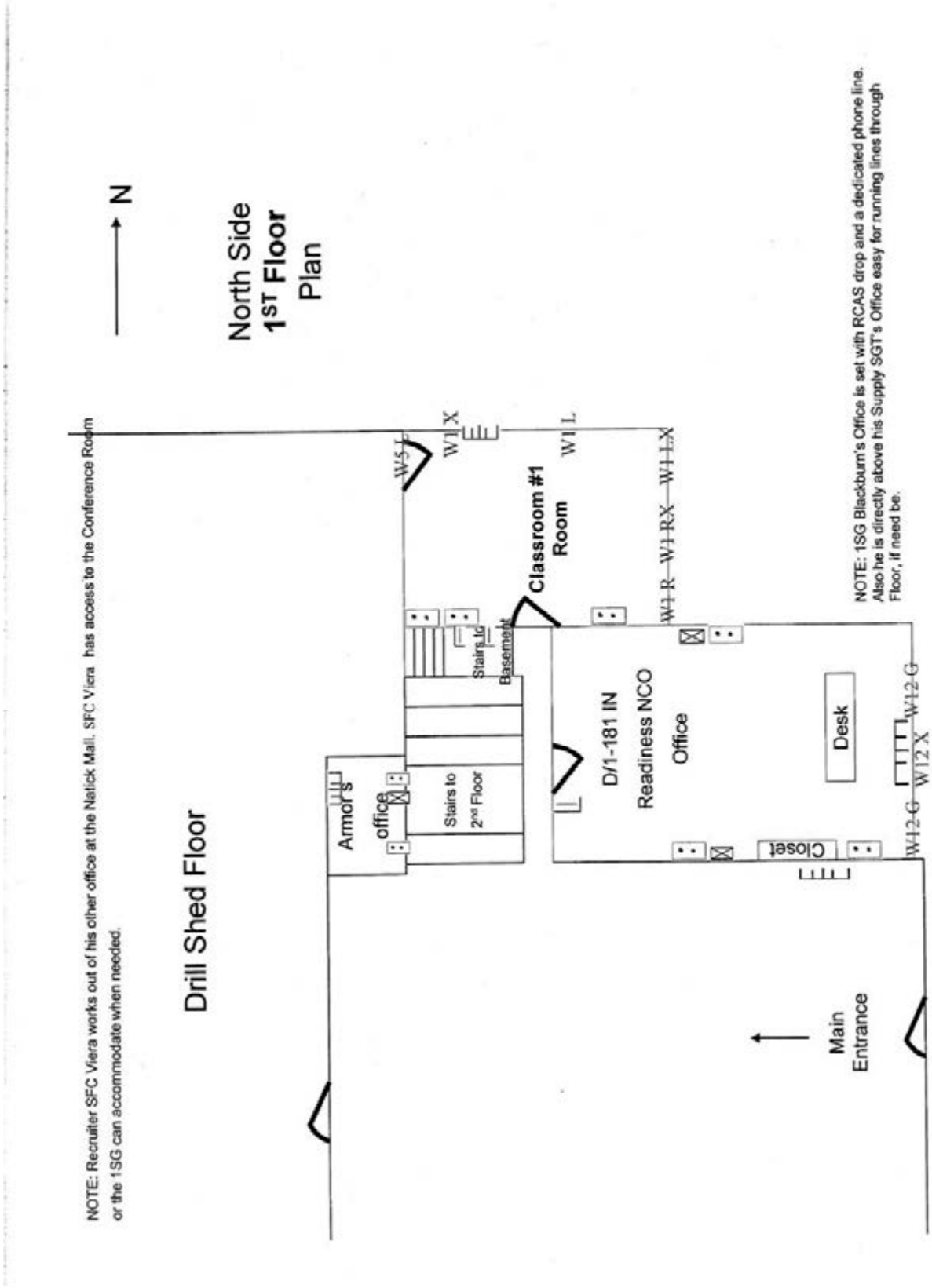
As with all such surveys, the results of the sampling represent conditions found on the date of the survey and may not represent conditions found at other times. Additionally, this survey was limited with respect to the specific parameters indicated above and should not be construed to be a comprehensive evaluation or a definitive representation of conditions within the facility. The information presented in this report is intended to be used as a guide to evaluate the need for further investigation or the need for modifications to the processes or procedures surveyed.

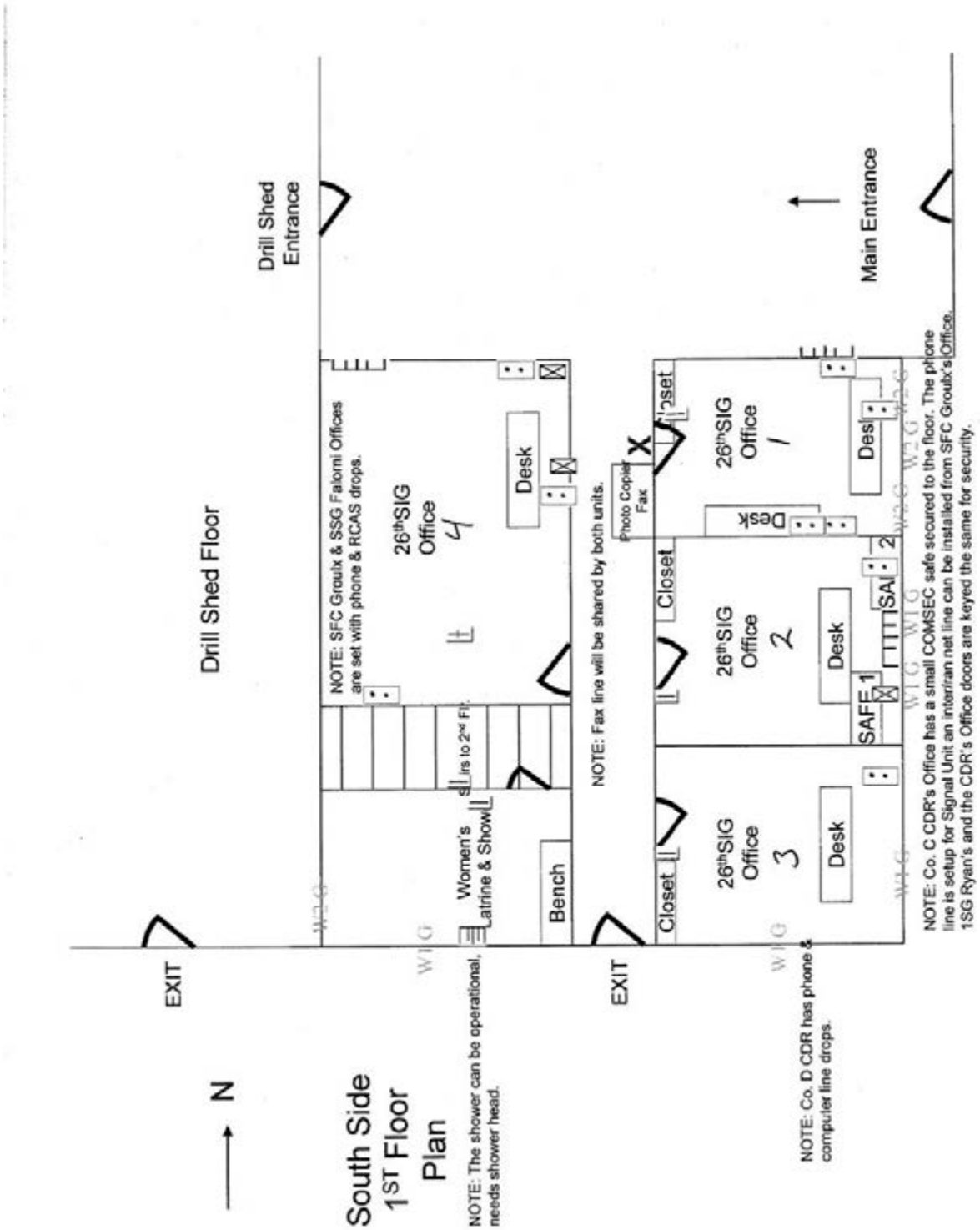
The Client recognizes and agrees that all testing and remediation methods have reliability limitations, no method nor number of sampling locations can guarantee that a condition will be discovered within the performance of the services as authorized by the Client. Additionally, the passage of time may result in a change in the environmental characteristics at this site. This report does not warrant against future operations or conditions that could affect the recommendations made. The results, findings, conclusions, and recommendations expressed in this report are based only on conditions that were observed during AECOM's inspection of the site.

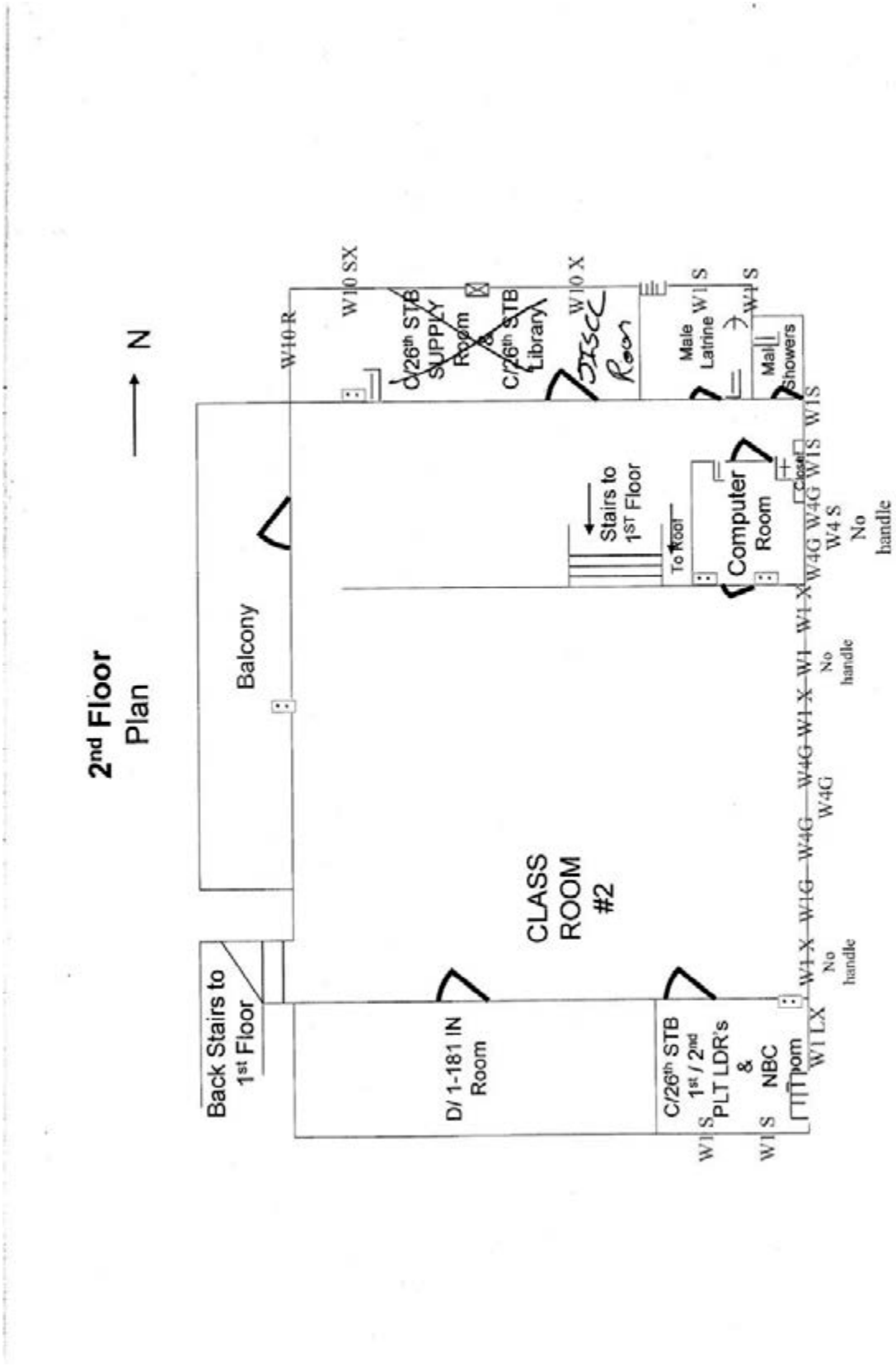
Appendix A

Hudson Readiness Center Facility Layout


Basement
Floor Plan
N
NOTE: Co. D
Room can be utilized as
storage and/or locker room.
NOTE: COMSEC vault
needs to be operational in
order to accept the multiple
COMSEC equipment that will
be arriving. This was the
original arms room and a
good portion of the old vault
structure is still intact
EXIT
D/1-181 IN Room
D/1-181 IN Room
C/26TH STB COMSEC VAULT
SECTION ROOM #1
SECTION ROOM #2
SECTION ROOM #3
SECTION ROOM #4
SECTION ROOM #5
SECTION ROOM #6
D/1-181 IN Room
Mess Hall / Training Room
Kitchen
C/26th STB Supply Room
D/1-181 IN Supply Room
NOTE: D Co. Supply Room is set with RCAS drop and phone line.
Boiler Room
Boiler
Armor's closet
C/26TH STB Signal supply
C/26TH STB Supply Section
C/26TH STB HQ Platoon
C/26TH STB 1st Platoon
C/26TH STB 2nd Platoon
C/26th STB Secured Cage
D/1-181 IN Secured Cage
Arms Vault
NOTE: Arms Vault needs to have Secured Weapon Cages installed.
W blocked vent
EXIT
EXIT
Screwed shut


N
North Side
1ST Floor
Plan
Drill Shed Floor
NOTE: Recruiter SFC Viera works out of his other office at the Natick Mall. SFC Viera has access to the Conference Room or the 1SG can accommodate when needed.
NOTE: 1SG Blackburn's Office is set with RCAS drop and a dedicated phone line. Also he is directly above his Supply SGT's Office easy for running lines through Floor, if need be.
Armor's office
Stairs to 2nd Floor
Stairs to Basement
Classroom #1 Room
D/1-181 IN Readiness NCO Office
Desk
Closet
Main Entrance
W5 L
W1 X
W1 L
W1 R
W1 RX
W1 LX
W12 G
W12 X


Drill Shed Floor
Drill Shed Entrance
Main Entrance
EXIT
EXIT
N
South Side
1ST Floor
Plan
NOTE: SFC Groulx & SSG Falorni Offices are set with phone & RCAS drops.
26th SIG Office 4
Desk
Women's Latrine & Shower
Bench
NOTE: The shower can be operational, needs shower head.
NOTE: Fax line will be shared by both units.
Photo Copier Fax
26th SIG Office 3
Desk
Closet
Closet
26th SIG Office 2
Desk
SAFE 1
SAFE 2
26th SIG Office 1
Desk
Desk
NOTE: Co. D CDR has phone & computer line drops.
NOTE: Co. C CDR's Office has a small COMSEC safe secured to the floor. The phone line is setup for Signal Unit an inter/ran net line can be installed from SFC Groulx's Office. 1SG Ryan's and the CDR's Office doors are keyed the same for security.



Appendix B

Hudson Readiness Center Photographs

Photograph 1

Building Exterior - Front

Photograph 2

Building Exterior - Rear

Photograph 3

Water Stained Ceiling Tile in Classroom #2

Photograph 4

Water Stained Ceiling Tile in Classroom #1

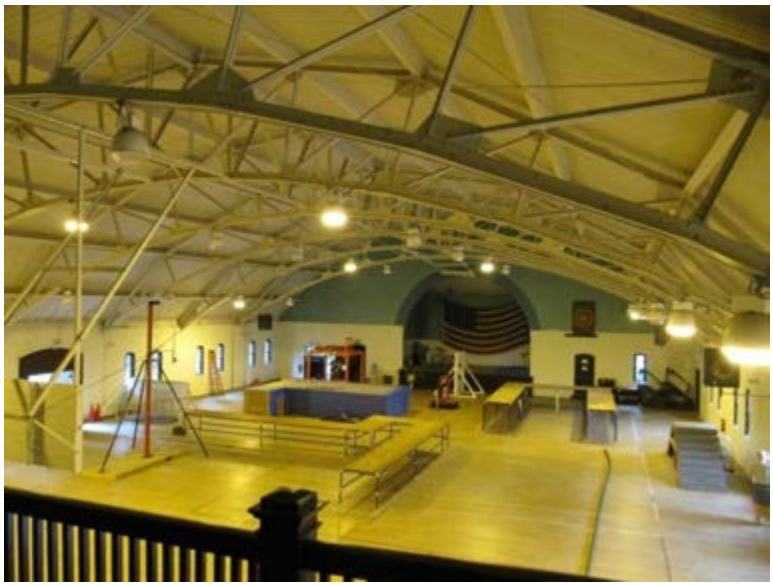
Photograph 5

Suspect ACM Window Glazing Compound

Photograph 6

Roofing Material

Photograph 7



Drill/Assembly Hall looking west

Photograph 8

Typical Floor Tile

Photograph 9

Typical ACM Pipe Insulation and radiant heating unit

Photograph 10

Typical ACM Pipe Insulation

Photograph 11

Bullet Trap

Photograph 12

Break area

Photograph 13

Former Firing Range

Photograph 14

Typical Radiant Heating Unit

Photograph 15

Boiler Room

Photograph 16

Kitchen Area

Appendix C

Analytical Results

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Hudson RC	**Chain Of Custody:**	508636
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Hudson, MA	**Date Submitted:**	8/24/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010 **Report Date:** 9/1/2010

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
1073301	HURC-01A	Flame	Air	175	N/A	17	ug/m^3	<3	<17	ug/m^3	
1073302	HURC-02A	Flame	Air	175	N/A	17	ug/m^3	<3	<17	ug/m^3	
1073303	HURC-01	Flame	Wipe	****	0.111	110	ug/ft^2	17	150	ug/ft^2	
1073304	HURC-02	Flame	Wipe	****	0.111	110	ug/ft^2	120	1100	ug/ft^2	
1073305	HURC-03	Flame	Wipe	****	0.111	110	ug/ft^2	28	250	ug/ft^2	
1073306	HURC-04	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073307	HURC-05	Flame	Wipe	****	0.111	110	ug/ft^2	77	700	ug/ft^2	
1073308	HURC-06	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073309	HURC-07	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073310	HURC-08	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073311	HURC-09	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073312	HURC-10	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073313	HURC-11	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
1073314	HURC-12	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	

An AIHA (#100470), NVLAP (101143-0), and NY ELAP (#10920) Accredited Laboratory

4475 Forbes Blvd. · Lanham, MD. 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Hudson RC	**Chain Of Custody:**	508636
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Hudson, MA	**Date Submitted:**	8/24/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010 **Report Date:** 9/1/2010

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.
Air and Wipe results are not corrected for any blank results
Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.
NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analyst: [redacted] Non-Responsive Manager: [redacted] Non-Responsive

An AIHA (#100470), NVLAP (101143-0), and NY ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

OWI (41Q 247-2024 159262 210 REV 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **508636**

Pg 1 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Hudson RC
2. Job Location: Hudson, MA
3. Job #:
4. Contact Perso[redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)
❑ Immediate Date Due:
❑ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
❑ Immediate ❑ 3 Day
❑ Next Day ☒ 5 Day + 4/3/10
❑ 2 Day Date Due:
❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[redacted] with Report
☒ Em[redacted] @AECOM.com
❑ Fax [redacted] @us.army.mil
❑ Ver[redacted] @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
❑ NIOSH 7400 (QTY)
❑ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
❑ AHERA (QTY)
❑ NIOSH 7402 (QTY)
❑ Other (specify) (QTY)
PLM Bulk
❑ EPA 600 – Visual Estimate (QTY)
❑ EPA Point Count (QTY)
❑ NY State Friable 198.1 (QTY)
❑ Grav. Reduction ELAP 198.6 (QTY)
❑ Other (specify) (QTY)
MISC
❑ Vermiculite
❑ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
❑ ELAP 198.4/Chatfield (QTY)
❑ NY State PLM/TEM (QTY)
❑ Residual Ash (QTY)
TEM Dust
❑ Qual. (pres/abs) Vacuum/Dust (QTY)
❑ Quan. (s/area) Vacuum D5755-95 (QTY)
❑ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
❑ Qual. (pres/abs) (QTY)
❑ ELAP 198.2/EPA 100.2 (QTY)
❑ EPA 100.1 (QTY)
☒ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Metals Analysis
❑ Pb Paint Chip (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 12 (QTY)
❑ Pb Air (QTY)
❑ Pb Soil/Solid (QTY)
❑ Pb TCLP (QTY)
❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
❑ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
❑ Spore-Trap (QTY) ❑ Surface Vacuum Dust (QTY)
❑ Surface Swab (QTY) ❑ Culturable ID Genus (Media) (QTY)
❑ Surface Tape (QTY) ❑ Culturable ID Species (Media) (QTY)
❑ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER (AND OTHER)	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
HURC																	
HRC-01	Billet Top	3/16/10		1 sq in				X								X	
HRC-02	Light Fixture-Range							X								X	
HRC-03	Floor - Range							X								X	
HRC-04	Folding Chair-Range							X								X	
HRC-05	Range Ext. Floor							X								X	Date/Time: Contact: By:
HRC-06	Drill Hall Floor							X								X	
HRC-07	Drill Hall Chair							X								X	
HRC-08	Drill Hall Sky Flag							X								X	
HRC-09	Class Rm 1 Desk							X								X	Date/Time: Contact: By:
HRC-10	Mess Hall Table							X									
HRC-11	Kitchen Counter							X									
HRC-12	Class Rm 2 Table							X									

[redacted] Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 3 / 24 / 10 @ Via: By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

OWI (410) 247-2024 159202 210REV 6.08

AMA Analytical Services, Inc.
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 508636
pg 2 of 2

Mailing/Billing Information:
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4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Hudson RC
2. Job Location: Hudson MA
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Pers[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day +
☐ 2 Day Date Due:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[redacted] with Report
☒ Em[redacted] AECOM. COM
☐ Fax[redacted] @us.army.mil
☐ Ve[redacted] @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 ______ (QTY)
☐ Fiberglass ______ (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA ______ (QTY)
☐ NIOSH 7402 ______ (QTY)
☐ Other (specify ______) ______ (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate ______ (QTY)
☐ EPA Point Count ______ (QTY)
☐ NY State Friable 198.1 ______ (QTY)
☐ Grav. Reduction ELAP 198.6 ______ (QTY)
☐ Other (specify ______) ______ (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield ______ (QTY)
☐ NY State PLM/TEM ______ (QTY)
☐ Residual Ash ______ (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust ______ (QTY)
☐ Quan. (s/area) Vacuum D5755-55 ______ (QTY)
☐ Quan. (s/area) Dust D6480-99 ______ (QTY)
TEM Water
☐ Qual. (pres/abs) ______ (QTY)
☐ ELAP 198.2/EPA 100.2 ______ (QTY)
☐ EPA 100.1 ______ (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples ______ °C)

Metals Analysis
☐ Pb Paint Chip ______ (QTY)
☐ Pb Dust Wipe (wipe type ______) ______ (QTY)
☒ Pb Air 2 (QTY)
☐ Pb Soil/Solid ______ (QTY)
☐ Pb TCLP ______ (QTY)
☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Pb Furnace (Media ______) ______ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ______
Collection Media ______
☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
☐ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION / ANALYSIS / MATRIX

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER	WIPE	TAPE	SWAB
HURC-HRC-01A	Class Rm #1	8/4/16	175					X		X						
HURC-HRC-02A	Drill Hall	8/4/16	175					X		X						

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: [redacted]

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: ___/___/___ @ ___ Via: ___ By (Print): ___ Si[redacted]
2. Date/Time Analyzed: ___/___/___ @ ___ By (Print): ___ Sign: ___
3. Results Reported To: ___ Via: ___ Date: ___/___/___ Time: ___
4. Comments: ___

Appendix D

References

References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current Ed. http://www.osha.gov/comp-links.html

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998. http://www.dtic.mil/whs/directives/corres/pdf/i60551_081998/i60551p.pdf

3. Army Regulation (AR) 11-34, The Army Respiratory Protection Program, 15 February 1990. http://www.usapa.army.mil/pdffiles/r11_34.pdf

4. AR 40-5, Medical Service, Preventive Medicine, 25 May 2007. http://www.usapa.army.mil/pdffiles/r40_5.pdf

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6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998. http://www.usapa.army.mil/pdffiles/p40_501.pdf

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8. DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000. http://www.usapa.army.mil/pdffiles/p40_503.pdf

9. UFC 3-410-01FA, Heating, Ventilating, and Air Conditioning, 15 May 2003. http://www.wbdg.org/ccb/DOD/UFC/ufc_3_410_01fa.pdf

10. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current Ed.

11. Industrial Ventilation – A Manual of Recommended Practice for Design, ACGIH, current Ed.

12. American National Standards Institute (ANSI) Z358.1-2004, Emergency Eyewash and Shower Equipment.

13. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) 62.1-2007, Ventilation for Acceptable Indoor Air Quality.

14. RP-1-2004, Office Lighting, ANSI/IESNA.

15. RP-7-2001, Industrial Lighting, ANSI/IESNA, change 20 July 2004.

16. Unified Facilities Criteria, (UFC) 3-410-01FA, Heating, Ventilating, and Air Conditioning, 15 May 2003, including change 3, Aug. 03.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
35 WASHINGTON STREET
HUDSON, MA 01749

July 12, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

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TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
35 WASHINGTON ST., HUDSON, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	Increase lighting in the work areas. While work is in progress, these areas must be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04).	RAC 4
Ergonomics		
Computer workstations in the Administrative Areas were observed with un-adjustable chairs, arm rests and keyboards.	Ergonomic issues with regard to the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3).	RAC 3
Water Intrusion		
Water staining was observed on ceiling plaster in the Assembly Hall and on ceiling tiles in the 1st floor Classroom.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Former Indoor Firing Range		
The former Indoor Firing Range has been posted as unsafe due to lead contaminated; however the area is still regularly used. The door to the area did not adequately secure lead dust from migrating out of the area.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Since the former indoor firing range is contaminated with lead and several wipe samples were found to contain elevated lead levels, an assessment should be made as to whether respiratory protection and other PPE should be worn when entering this area.	A respirator shall be provided for each employee when such equipment is necessary to protect the health of the employee. (29 CFR 1910.134 (a)(2)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Lead		
Eight of the 10 lead wipe samples indicated elevated lead levels.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Emergency Exits		
Emergency exit signs were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
Hazard Communication		
No hazard communication program was found at the site.	A written hazard communication program shall be developed, implemented and maintained at each workplace (29 CFR 1910.1200 (e()1)).	RAC 3
Slips, Trips and Falls Hazards		
Several slips, trips and falls hazards were identified during the survey- boards with nails sticking out of them stored on the floor, floor tiles pulling up at entranceways and cords extended across walkways. An unmarked hole was present in the concrete basement floor.	Every floor, work space or passageway shall be kept free from protruding nails, splinters, holes or loose boards (29 CFR 1910.22 (a)(3)).	RAC 3
Ladder Storage		
Two ladders were observed not properly stored in the first floor classroom and basement boiler room.	Ladders not in use shall be properly stored in a vertical position fastened to walls (29 CFR 1910.25 (c)(2)(i)).	RAC 4
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operations and Maintenance Program was not available on-Site.	Employees must be informed of the hazards of the presumed ACM in the building and procedures put in place for managing such materials (29 CFR 1910.1001 (j)).	RAC 4

Findings	Recommendations	Risk Assessment Code (RAC)
Personal Protective Equipment		
Hazard assessments have not been conducted to determine whether personal protective equipment is required.	The workplace shall be assessed to determine if hazards are present to determine the need for PPE (29 CFR 1910.132 (d)(1)).	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center in Hudson, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on March 29, 2013. The scope of work included an overall assessment of the facility as it relates to industrial hygiene and included a walkthrough of the facility, collection of photographs, and when required, measurements for illumination (light), area and personal air sampling, and noise mapping.

The Hudson Readiness Center is a two-story brick building, consisting of offices, classrooms, a supply area, gender separate bathrooms, locker storage rooms, storage rooms, a kitchen, break room, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Moderate water staining was observed on ceiling plaster along the west perimeter of the Assembly Hall and ceiling tiles in the first floor classroom as a result of roof leaks. Evidence of moderate water intrusion was observed along the exterior doorway in the basement classroom. The basement former Indoor Firing Range has not been decontaminated and is posted as unsafe due to lead contamination, however the area is currently used for storage and is still accessed regularly. The door to the area does not secure lead dust from migrating from the area into other portions of the building. Boards with nails in them were observed stored on the floor in the basement locker storage area. An unmarked hole was observed in the concrete floor of the basement corridor.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in seven of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress, work areas must be lighted by at least the minimum light intensities.

LEAD: Eight of ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

Since the former indoor firing range is accessible to staff, a hazard assessment should be conducted to determine whether respiratory protection and other forms of Personal Protective Equipment (PPE) should be worn by individuals entering the former firing range.

On the day of the survey, one of the paint chip samples was found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: On the day of the survey none of the bulk samples were determined to be asbestos-containing. Presumed asbestos-containing floor tiles and associated mastic were identified during this survey, however no Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. Computer workstations were assessed during the walkthrough for ergonomic issues. The computer workstations in the facility did not meet the current Occupational Safety and Health Administration (OSHA) ergonomic recommendations. The chairs armrests, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Personal noise monitoring levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit. Noise mapping in the basement boiler room while the boiler was operating indicated that boiler room noise levels were above the OSHA PEL

and DoDI Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit, although nobody spends extended time in the boiler room.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, gender separate bathrooms, locker storage rooms, storage rooms, a kitchen, break room, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be slightly cluttered and unorganized at the time of URS' site visit.

2.2 Chemical and Physical Agents Sampled

2.2.1 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made in the Readiness Center. Interior carbon dioxide concentrations were found to be between 475 and 584 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is human respiration. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems but is typically used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

To minimize air quality complaints, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed that the carbon dioxide concentration within an occupied workspace be maintained below 700 ppm above ambient outside levels. For example, on the day of the survey, the outside carbon dioxide level was measured at 428 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1,128 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Readiness Center was measured between 0.0 ppm and 0.5 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Trak Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 30.3%, which was within the guideline of less than 65% recommended by ASHRAE.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

The average temperature inside the Readiness Center was, 71.3 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot candles (FC) and the recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
1st Floor, Admin/ Break Room, center table	Break Room	32.3	10
1st Floor, Office at South Corner, desk- Non-Responsive	Admin	**34.9**	50
1st Floor, Office at South/ Center, desk- vacant	Admin	83.3	50
1st Floor, Office at South, towards Lobby, desk- vacant	Admin	**29.0**	50
1st Floor, Admin Area, hall at copier	Hall	27.0	5
1st Floor, Office North of Lobby, desk- Non-Responsive	Admin	**16.1**	50
1st Floor, Office North of Lobby, desk- vacant	Admin	**12.5**	50
1st Floor, North Classroom, center table	Admin	**27.3**	50
2nd Floor, South Classroom, front table	Admin	**31.2**	50
2nd Floor, South Classroom, rear table	Admin	68.8	50
Basement, Break Room, table	Break Room	39.0	10
Basement, Break Room, table	Break Room	40.9	10
Basement, North Storage Area	Storage	46.5	30
Basement, West Perimeter, storage bay	Storage	**21.0**	30

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in seven of the office/administrative locations.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Basement, Kitchen, floor at doorway	Hudson RC Wipe-01	0.108	**1,600**	200
1st Floor, South Offices, vacant middle office, fire place frame	Hudson RC Wipe-02	0.108	120	200
2nd Floor, Classroom, wooden shelf south perimeter by offices	Hudson RC Wipe-03	0.108	**1,800**	200
1st Floor, Admin/ Break Room, top of black mini-fridge	Hudson RC Wipe-04	0.108	<110	200
Basement, Break Room, floor, under microwave table	Hudson RC Wipe-05	0.108	**1,400**	200
Basement, former Indoor Firing Range, floor at doorway	Hudson RC Wipe-06	0.108	**2,900**	200
Basement, outside former Indoor Firing Range, floor, southeast corner	Hudson RC Wipe-07	0.108	**1,900**	200
Basement, South Storage, floor, south perimeter	Hudson RC Wipe-09A	0.108	**840**	200
Drill Hall, top of treadmill in southeast corner	Hudson RC Wipe-09B	0.108	**6,800**	200
Basement, north storage, south perimeter wall	Hudson RC Wipe-10	0.108	**1,400**	200

Eight of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Four paint chip samples were collected from areas of peeling paint throughout the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Beige paint, walls, 1st floor, office north of lobby, under window	**12**	0.5
Brown/ green paint, 1st floor, classroom, double door frame	0.27	0.5
Gray/ dark gray paint, Basement Break Room, floor	0.27	0.5
Green/ blue paint, Basement south storage room, walls	0.094	0.5

On the day of the survey, one of the paint chip sample was found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

URS collected a total of six samples from damaged suspect friable asbestos-containing material (ACM) in the basement for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) recommended method for the determination of asbestos in bulk samples by polarized light microscopy with dispersion staining (EPA-600/M4-82-020). Table 2-4 below shows the results of the asbestos sampling.

Table 2-4
Asbestos Bulk Sample Results – Basement

Sample Location	Sample Description	URS Sample Number	Result Total Asbestos
Basement, Break Room, emergency exit	Plaster/ Wallboard	Hudson RC PLM-01A- 01C	Non-detect
Basement, west storage room off south storage room, ceiling	Ceiling Plaster/ Wallboard	Hudson RC PLM-02A- 02C	Non-detect

The EPA states that any material with an asbestos content greater than 1% must be treated as ACM (EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix C.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Personal noise dosimetry was conducted within the administrative office area. Noise exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Personal

noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-5 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-5
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Non-Responsive	Administrative	368	77.0	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

In addition, noise mapping was conducted in the basement Boiler Room while the boiler was operating. Noise levels in the Boiler Room while the boiler was operating were 89.1 decibels, which is above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 dBA/8-hour day.

2.5 Personal Protective Equipment

PPE was orderly and readily available to employees in the Readiness Center. PPE included safety glasses, ear plugs and nitrile gloves. PPE was not observed in use at the time of URS' site visit.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility.

3.2 Hearing Conservation

A written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection. If workers are allowed access to the former firing range, a hazard assessment should be conducted to determine whether respiratory protection and other forms of PPE should be required in this area.

3.4 Hazard Communication

A site-specific hazard communication program was not identified on site. A hazard communication program is required for this site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written PPE program was not identified on site. A hazard assessment should be conducted to determine whether PPE is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

The basement former Indoor Firing Range was posted as unsafe due to lead contamination. According to interviews with site personnel, the former Indoor Firing Range is still used on a regular basis. The door to the former Indoor Firing Range does not provide a secure barrier to ensure that lead dust does not migrate outside the contaminated area. Ladders were observed not properly stored in the first floor classroom and in the basement boiler room. Cords were observed extending across a doorway on the first floor, between the Assembly Hall and north classroom. Floor tiles were noted to be pulling up in the first floor main entrance. One chair with four casters was identified in the second floor classroom. Boards with nails were observed stored on the floor in the basement, with nail extending upwards. An unmarked hole was noted in the concrete floor in the basement corridor. Not all emergency exit signs were properly illuminated throughout the facility.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program, 15 August 2003

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

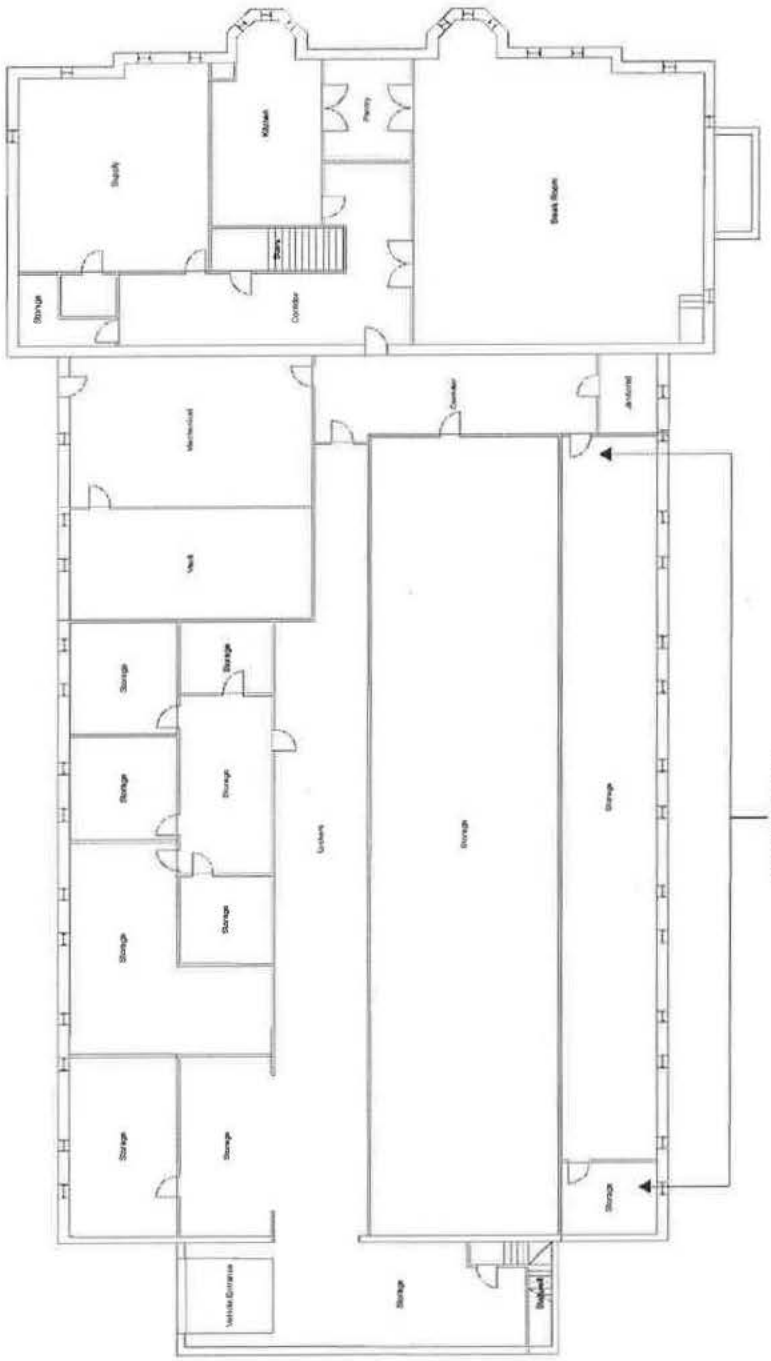
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE

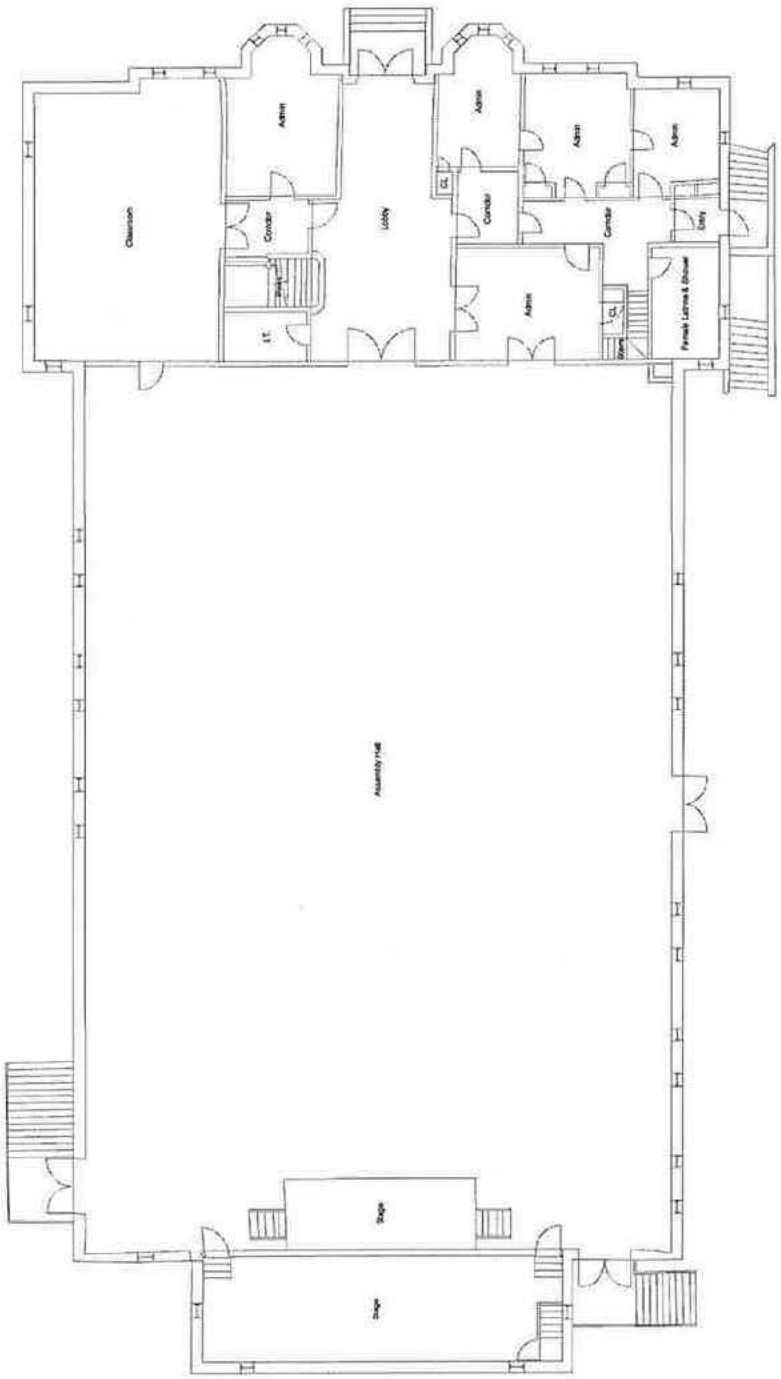
HUDSON - 25B35
Basement Floor Plan

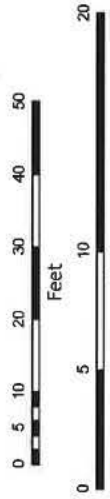


05 January 2012

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE

HUDSON - 25B35
First Floor Plan

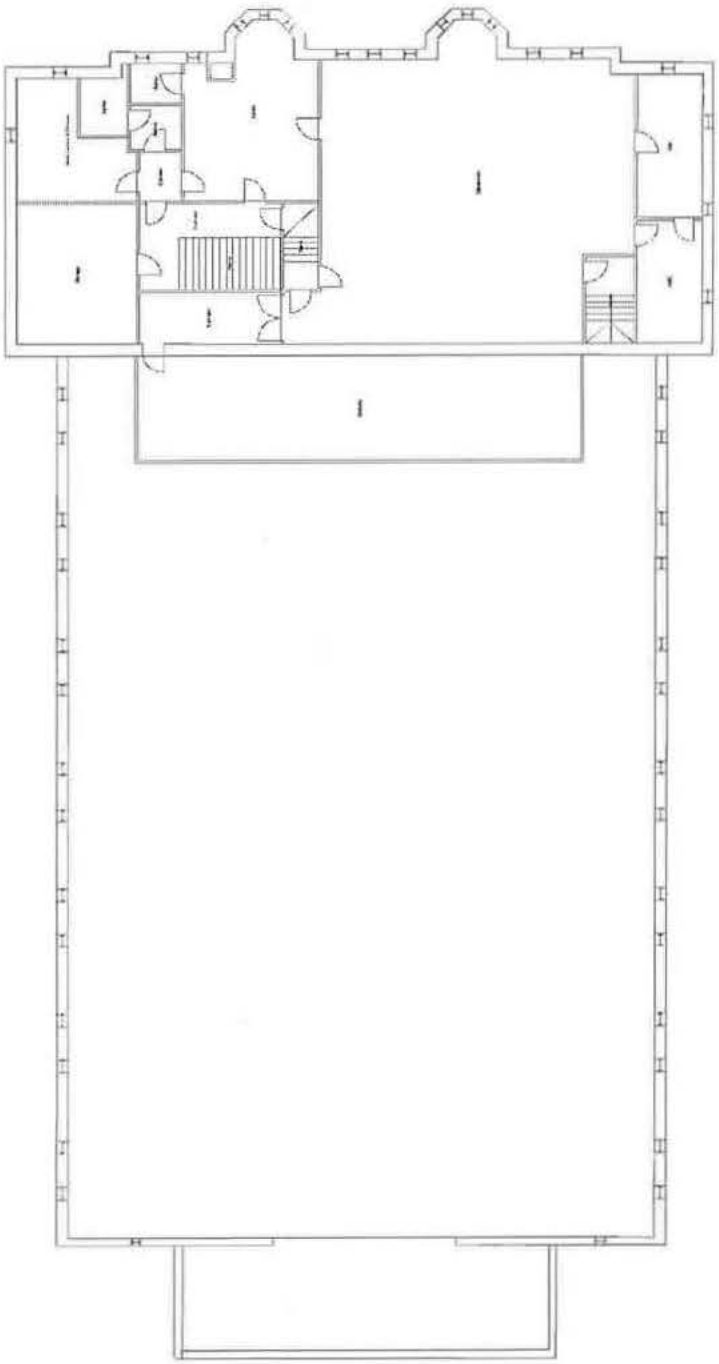


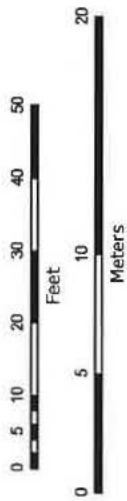


05 January 2012

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE

HUDSON - 25B35
Second Floor Plan





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05 January 2012

APPENDIX B

PERSONNEL LIST

List of Full-Time Personnel was not available at the time of the survey.

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515482
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	35 Washington Street, Hudson, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hudson RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/8/2013

Report Date: 4/8/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13049898	Hudson RC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft²	170	1600	ug/ft²	
13049899	Hudson RC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13049900	Hudson RC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft²	190	1800	ug/ft²	
13049901	Hudson RC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13049902	Hudson RC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft²	150	1400	ug/ft²	
13049903	Hudson RC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft²	310	2900	ug/ft²	
13049904	Hudson RC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft²	210	1900	ug/ft²	
13049905	Hudson RC Wipe-09A	Flame	Wipe	****	0.108	110	ug/ft²	90	840	ug/ft²	
13049906	Hudson RC Wipe-09B	Flame	Wipe	****	0.108	110	ug/ft²	730	6800	ug/ft²	
13049907	Hudson RC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft²	160	1400	ug/ft²	
13049908	Hudson RC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13049909	Hudson RC LBP-01	Flame	Paint Chip	****	N/A	0.0059	%Pb		12	%Pb	
13049910	Hudson RC LBP-02	Flame	Paint Chip	****	N/A	0.0065	%Pb		0.27	%Pb	
13049911	Hudson RC LBP-03	Flame	Paint Chip	****	N/A	0.0077	%Pb		0.27	%Pb	
13049912	Hudson RC LBP-04	Flame	Paint Chip	****	N/A	0.0083	%Pb		0.094	%Pb	

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Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515482
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	35 Washington Street, Hudson, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hudson RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/8/2013
Attention:	Non-Responsive			**Report Date:**	4/8/2013

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

OWI (410) 247-2024

159202

515482

pg 1 of 2

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To Ti... Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA IABNG
2. Job Location: 35 Washington St, Hudson, MA
3. Job #: Hudson BC
4. Contact Pe... Non-Responsive
5. Submitted ... Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): phone: Non-Responsive

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include ... th Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day + Date Due: 4/8/13	☐ Fax: Non-Responsive
Comments:	☐ 2 Day ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Verb...

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 10 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ___ °C)

Metal Analysis
- ☒ Pb Paint Chip 4 (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media 1) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
HudsonBC Wipe-01	admin	3/21/13		100 cm²				X				X				
HudsonBC Wipe-02								X				X				
HudsonBC Wipe-03								X				X				
HudsonBC Wipe-04								X				X				
HudsonBC Wipe-05								X				X				
HudsonBC Wipe-06	maintenance							X				X				
HudsonBC Wipe-07								X				X				
HudsonBC Wipe-08								X				X				
HudsonBC Wipe-09								X				X				
HudsonBC Wipe-10								X				X				
HudsonBC Wipe-FB	Field blank			—				X				X				
HudsonBC LBP-01	beige paint							X			X					

CLIENT CONTACT

(LABORATORY STAFF ONLY)

Date/Time: 4/5 Contact: BF By: NRM
Two sample #09 & No sample #08.

Date/Time: 4/8 Contact: NRM By: BF
Label both samples as 09. Lab to issue A + B See email.

Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 4/1/13 @845 Via: FEDEX By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 7940 6954 8677

159202 210 REV. 8.08

515482

pg 2 of 2

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA JARNG
2. Job Location: 35 Washington St, Hudson, MA
3. Job #: Hudson RC PO #: W912K8-09-A-0003
4. Contact Person: Non-Responsive Non-Responsive
5. Submitted by: phone:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☐ Joe Non-Responsive th Report
☐ 24 Hours Time Due:	☒ 5 Day +	☐ Jim vrs.com
Comments:	☐ 2 Day Date Due:	☐ Pa us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ve us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 10 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☒ Pb Paint Chip 4 (QTY)
- ☒ Pb Dust Wipe (wipe type other) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
- ☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
- ☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
- ☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: ITEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Hudson RC LBP-02	brown/green paint	3/29/13						X			X					
Hudson RC LBP-03	gray/white/gray paint							X			X					
Hudson RC LBP-04	green/blue paint							X			X					
Hudson RC PLM-01A	plaster/wallboard						X				X					
Hudson RC PLM-01B							X				X					
Hudson RC PLM-01C							X				X					
Hudson RC PLM-02A	ceiling plaster/ wallboard						X				X					
Hudson RC PLM-02B							X				X					
Hudson RC PLM-02C							X				X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515482
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	35 Washington Street, Hudson, MA	**Date Analyzed:**	4/8/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hudson RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13049913	Hudson RC PLM-01A PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049914	Hudson RC PLM-01B PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049915	Hudson RC PLM-01C PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049916	Hudson RC PLM-01A WB	NAD	--	--	--	--	--	--	TR	--	--	100	WB	Off-White	Homogeneous	SW	
13049917	Hudson RC PLM-01B WB	NAD	--	--	--	--	--	--	--	--	--	100	WB	Off-White	Homogeneous	SW	
13049918	Hudson RC PLM-01C WB	NAD	--	--	--	--	--	--	--	--	--	100	WB	Off-White	Homogeneous	SW	
13049919	Hudson RC PLM-02A PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049920	Hudson RC PLM-02B PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049921	Hudson RC PLM-02C PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	Off-White	Homogeneous	SW	
13049922	Hudson RC PLM-02A WB	NAD	--	--	--	--	--	--	--	TR	--	100	WB	Gray	Homogeneous	SW	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515482
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	35 Washington Street, Hudson, MA	**Date Analyzed:**	4/8/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Hudson RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13049923	Hudson RC PLM-02B WB	NAD	--	--	--	--	--	--	--	TR	--	100	WB	Gray	Homogeneous	SW	
13049924	Hudson RC PLM-02C WB	NAD	--	--	--	--	--	--	--	TR	--	100	WB	Gray	Homogeneous	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

Cell (410) 247-2024

159202

515482

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

pg 1 of 2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA IARNG
2. Job Location: 35 Washington St., Hudson, MA
3. Job #: Hudson BC
4. Contact Perso[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided as soon as technically feasible): e-phone:

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Incl[redacted] with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day + Date Due: 4/8/13	☒ Tim[redacted]
Comments:	☐ 2 Day ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ Fax:
		☐ Verb[redacted]

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 10 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☒ Pb Paint Chip 4 (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Hudson BC Wipe-01	ADMIN	3/27/13		100 cm²				X				X				
Hudson BC Wipe-02								X				X				
Hudson BC Wipe-03								X				X				
Hudson BC Wipe-04								X				X				
Hudson BC Wipe-05								X				X				
Hudson BC Wipe-06	MAINTENANCE							X				X				
Hudson BC Wipe-07								X				X				
Hudson BC Wipe-08								X				X				
Hudson BC Wipe-09								X				X				
Hudson BC Wipe-10								X				X				
Hudson BC Wipe-FB	Field blank			—				X				X				
Hudson BC LBP-01	beige paint							X								

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 4/1/13 @845 Via: FEDE[redacted]
2. Date/Time Analyze[redacted] By (Print): [redacted]
3. Results Reported T[redacted] ST AVAILABLE VIA:
4. Comments: 7990 6139 80[redacted]

Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 515482

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA JARNG
2. Job Location: 35 Washington St, Hudson, MA
3. Job #: Hudson RC P.O. #: W912K6-09-A-0002
4. Contact Perso [redacted] Non-Responsive
5. Submitted by [redacted] Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): → phone: [redacted] Non-Responsive

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	[redacted] Non-Responsive with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	@urs.com
Comments:	☐ 2 Day Date Due:	☐ Fax @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ver @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 10 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☒ Pb Paint Chip 4 (QTY)
- ☒ Pb Dust Wipe (wipe type: GHOST) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

SAMPLE INFORMATION: CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	MATRIX: BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
Hudson RC LBP-02	brown/green paint	3/29/13						X			X						Date/Time: Contact: By:
Hudson RC LBP-03	gray/white/gray paint							X			X						
Hudson RC LBP-04	green/blue paint							X			X						
Hudson RC PLM-01A	plaster/wallboard						X				X						
Hudson RC PLM-01B							X				X						Date/Time: Contact: By:
Hudson RC PLM-01C							X				X						
Hudson RC PLM-02A	ceiling plaster/ wallboard						X				X						
Hudson RC PLM-02B							X				X						
Hudson RC PLM-02C							X				X						Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Hudson RC	35 Washington Street, Hudson, MA	39743799

Photo No.	Date:
1	3/29/13

Description:

Door to former Indoor Firing Range, posted as lead-contaminated.

Photo No.	Date:
2	3/29/13

Description:

Evidence of water intrusion in ceiling of first floor classroom.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Hudson RC	35 Washington Street, Hudson, MA	39743799

Photo No.	Date:
3	3/29/13

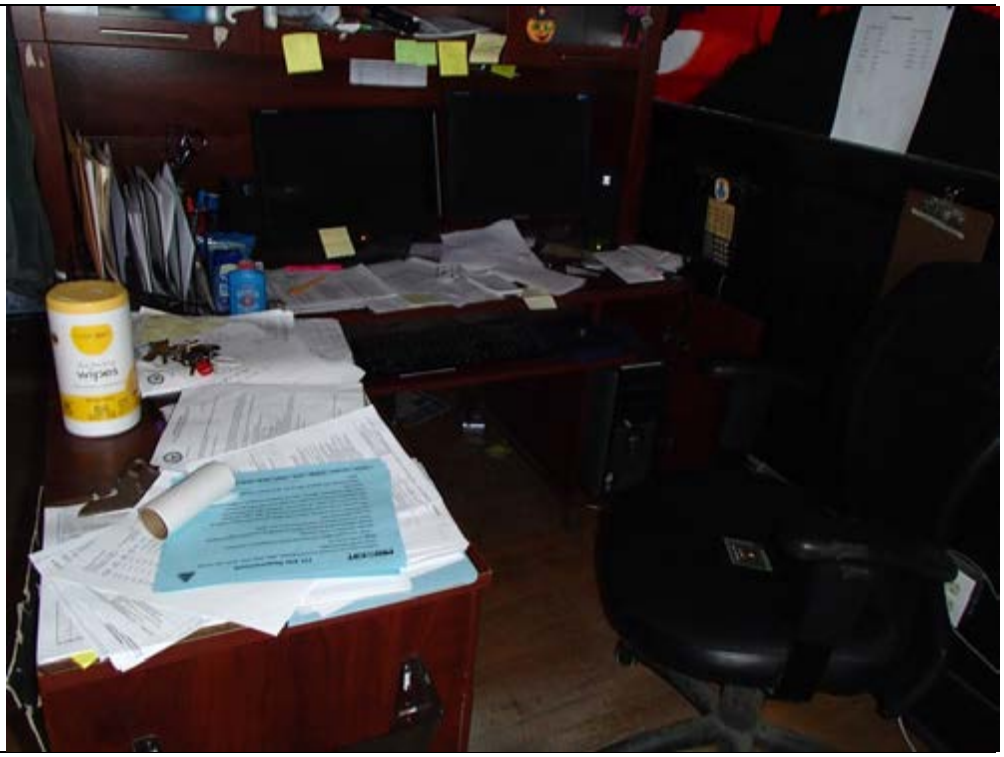
Description:

Presumed asbestos-containing floor tiles and associated mastic pulling up at the main entrance.

Photo No.	Date:
4	3/29/13

Description:

Typical office setting and ergonomics.



P:\Project\National Guard Bureau\39743798 IH Services ME & MA\39743799 - MA Sites\Reports\Hudson RC\Hudson RC Photo Log docx

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
HYANNIS READINESS CENTER
225 SOUTH STREET
HYANNIS, MASSACHUSETTS

Non-Responsive
Office Manager

Non-Responsive
Project Manager

July 2005
PN: 39741508

TABLE OF CONTENTS

TABLE OF CONTENTS (cont)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lead		
Lead was detected in wipe samples collected from the former firing range, classroom #6 and ladies room #10 in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Damaged floor tile was present in classroom #6, mess hall #7, kitchen #8 and in storage room #13. Exposed pipefitting insulation was found in area # 27 and in room #14.	Repair or remove asbestos-containing floor tile and pipefitting insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
No site specific asbestos operations and maintenance plan available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Walking Surfaces		
Clutter in the Ladies Shower Room creates a tripping hazard	Keep all passages and walking surfaces clean and free of clutter (OSHA 29CFR1910.22(a)(1).	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 225 South Street in Hyannis, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 3, 2004, Mr. Non-Responsive, an industrial hygienist with URS, conducted a site visit to the Readiness Center in Hyannis, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building. Computer workstations were not assessed during the walkthrough for ergonomic issues. The computer workstations had been removed from the offices because the troops had been deployed from this location.

Housekeeping in the ladies shower room # 9 was an issue. Many tripping hazards exist in the area from things being left in disarray (Photo # 3493)

Many cans of old paint and other miscellaneous items were stored in area # 27 (Photo # 3500). One of the containers was a bucket of old roofing tar, which contained asbestos eccording to its label (Photo # 3501).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 20.0 – 25.3% with an average of 24.3%. This reading was below the recommended levels of between 30.0% and 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.(ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 408 to 516 parts per million (ppm), with an average of 426 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Given a background level of 426 ppm on the day of the survey, the ASHRAE limit would be 1126 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. The carbon monoxide concentration remained at 0 parts per million (ppm) throughout the survey period. The measured level was below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Locetion	Function	Measured Illuminance (lux)	Recommended Minimum Illuminance (lux)
Office # 1	Administrative Duties	772	500
Office # 2	Administrative Duties	1262	500
Office # 3	Administrative Duties	1576	500
Office # 4	Administrative Duties	1520	500
Office # 5 – Desk by the Door	Administrative Duties	1841	500
Office # 5 – Far Side Desk	Administrative Duties	967	500
Hallway # 18	Accessway	166	30
Hallway # 22	Accessway	118	30

On the day of the survey the illuminance in the administrative area was adequate in all offices.

2.2.5 Lead

Paint chips were collected in four areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. All four samples were found to contain lead in a concentration below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Office # 1	0203-LPC01	0.01	0.031
Dining Room # 7	0203-LPC03	0.01	0.052
Men's Room # 11	0203-LPC04	0.01	0.074
Stairway to Boiler Room # 28	0203-LPC05	0.01	0.014

The analytical report from AMA is contained in Appendix D.

Wipe testing for lead dust was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Classroom # 6 – Top of a File Cabinet	0203-LW03	1.000	330	200
Ladies Room # 10 – Top of a Locker	0203-LW04	1.000	4500	200
Weight Room # 14 – Top of a Desk	0203-LW05	1.000	24	200
Office # 1 – Top of a Bookcase	0203-LW06	1.000	150	200
Blank	0203-LWBlank	N/A	<12 µg	N/A

2.2.6 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-4 below presents the results of the sample analysis.

Table 2-4
Sample Results of Suspect ACM in the Administrative Area

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Office # 4	6" Black Cove Base	0203-AB01A-CB	NAD
Classroom # 6	6" Black Cove Base	0203-AB01B-CB	NAD
Dining Area # 7	6" Black Cove Base	0203-AB01C-CB	NAD
Office # 4	6" Black Cove Base Mastic	0203-AB01A-TM	NAD
Classroom # 6	6" Black Cove Base Mastic	0203-AB01B-TM	NAD
Dining Area # 7	6" Black Cove Base Mastic	0203-AB01C-TM	NAD
Classroom # 6	9"x9" Brown Floor Tile	0203-AB02A	2
Dining Area # 7	9"x9" Brown Floor Tile	0203-AB02A	2
Dining Area # 7	9"x9" Brown Floor Tile	0203-AB02A	2
Storage Room # 13	12"x12" White Floor Tile	0203-AB03A	2
Storage Room # 13	12"x12" White Floor Tile	0203-AB03B	2
Storage Room # 13	12"x12" White Floor Tile	0203-AB03C	2
Weight Room # 14	Pipefitting Insulation	0203-AB04A	20
Weight Room # 14	Pipefitting Insulation	0203-AB04B	45
Hallway # 25	Pipefitting Insulation	0203-AB04C	30

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM. The analytical report from AMA is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly, except for room #9. The fire exits and extinguishers were marked and easily accessible.

LIGHTING: On the day of the survey, the luminance in the administrative area was adequate in all offices.

LEAD: The eight surfaces that were tested in the administrative area for lead, two were found to contain lead in quantities greater than 200 micrograms per square foot. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: Damaged 9"x9" brown and 12"x12" white floor tile, which was determined to contain asbestos in a concentration greater than one percent, was found in classroom #6 (Photo # 3488), mess hall #7 (Photo # 3490), kitchen #8 (Photo # 3492) and storage room #13 (Photo # 3495). Damaged pipe fittings were found in room # 14 and in hallway # 27 (Photos # 3496 & 3499). It is recommended that the damaged tile be replaced with new, non-asbestos tile and remove or repair the damaged pipe fittings. This work should be performed by an appropriately trained technician.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Top of Light Guard	0203-LW07	0.917	1200	200
Former Firing Range-Top of a Light Fixture	0203-LW08	0.972	21.000	200
Former Firing Range-Floor-Front	0203-LW09	1.000	490	200
Former Firing Range-Floor-Center	0203-LW10	1.000	540	200
Former Firing Range-Floor-Rear	0203-LW11	1.000	590	200
Blank	0203-LWBlank	N/A	<12 µg	N/A

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0203-LA02	872	<3.4	50.0
Blank	0203-LA03	N/A	<12 μg	200

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 3-3 below presents the results of the sample analysis.

Table 3-3
Samples of Suspect ACM from the Former Firing Range

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Former Firing Range	Brown Glue Daubs	0203-AB05A	NAD
Former Firing Range	Brown Glue Daubs	0203-AB05B	NAD
Former Firing Range	Brown Glue Daubs	0203-AB05C	NAD

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: The five surface wipe samples collected in the former firing range were found to contain lead dust levels above the maximum limit set by the National Guard Bureau. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. The former indoor firing range should be cleaned in accordance with Policy And Responsibilities For Inspection, Evaluation And Operation of ARNG Indoor Firing Ranges (IFR) And Guidelines For IFR Rehabilitation, Conversion And Cleaning (Appendix H).

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,000 square foot area with about a 30-foot high ceiling used for assembling personnel and storing equipment. The walls are constructed of cinder-block with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Drill Hall # 19-Floor	0203-LW01	1.000	14	200
Drill Hall # 19-Floor	0203-LW02	1.000	14	200
Blank	0203-LWBlank	N/A	<12 µg	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0203-LA01	876	<3.4	50.0
Blank	0203-LA03	N/A	<3.0 µg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

One Paint chip was collected where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-2 below shows the results of the lead paint testing.

Table 4-3
Levels of Lead in Paint Found in the Drill Hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Drill Hall # 19	0203-LPC02	0.01	0.052

The analytical report from AMA is contained in Appendix D.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: The air and paint chip samples collected in the drill hall for lead were found to be within allowable limits and require no further action at this time. The NGB Region North Industrial Hygiene Office has prepared a memorandum titlad "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No environmental issues were noted in the boiler room at the time of this survey.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62-2001: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Dafense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Polfutants (40 CFR Part 61)

U. S. Housing and Urban Developmant

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING

URS

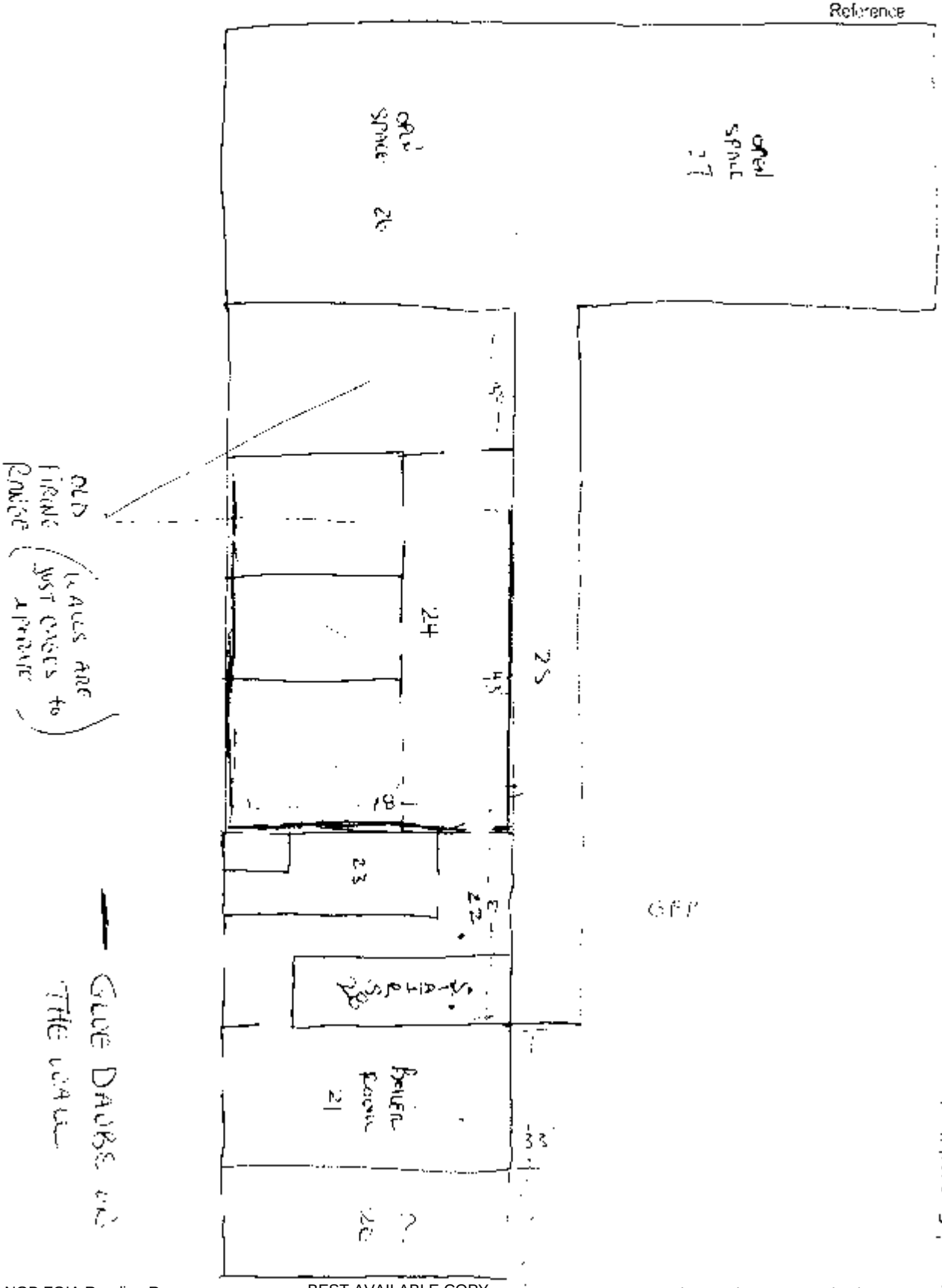
Page ____ of ____

Job | Project No | Sheet ____ of ____

Description | Computed by | Date

Checked by | Date

Reference



APPENDIX B

PERSONNEL LIST

NO STAFF ON SITE

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122892
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	225 South Street, Hyannis, MA	**Date Analyzed:**	02/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	18-Feb-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0424963	0203-LA 01	Flame	Air	876	N/A	3.42	ug/m³	<	3.4	ug/m³	
0424964	0203-LA 02	Flame	Air	872	N/A	3.44	ug/m³	<	3.4	ug/m³	
0424965	0203-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	
0424966	0203-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb		0.031	%Pb	
0424967	0203-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb		0.052	%Pb	
0424968	0203-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb		0.074	%Pb	
0424969	0203-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb		0.014	%Pb	
0424970	0203-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb		0.19	%Pb	
0424971	0203-LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²		14	ug/ft²	
0424972	0203-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²		14	ug/ft²	
0424973	0203-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²		330	ug/ft²	
0424974	0203-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²		4500	ug/ft²	
0424975	0203-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²		24	ug/ft²	
0424976	0203-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²		150	ug/ft²	
0424977	0203-LW 07	Flame	Wipe	****	0.917	13.09	ug/ft²		1200	ug/ft²	
0424978	0203-LW 08	Flame	Wipe	****	0.972	12.34	ug/ft²		21000	ug/ft²	
0424979	0203-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²		490	ug/ft²	
0424980	0203-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²		540	ug/ft²	
0424981	0203-LW 11	Flame	Wipe	****	1.000	12.00	ug/ft²		590	ug/ft²	
0424982	0203-LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122892
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	225 South Street, Hyannis, MA	**Date Analyzed:**	02/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	18-Feb-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] l Manager [redacted]

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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122892
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	225 South Street, Hyannis, MA	**Date Analyzed:**	02/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0424983	0203-AB 01 A-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0424984	0203-AB 01 B-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0424985	0203-AB 01 C-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0424986	0203-AB 01 A-TM	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0424987	0203-AB 01 B-TM	NAD	--	--	--	--	--	--	TR	--	--	100	Yellow	LB	
0424988	0203-AB 01 C-TM	NAD	--	--	--	--	--	--	TR	--	--	100	Brown	LB	
0424989	0203-AB 02 A	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0424990	0203-AB 02 B	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0424991	0203-AB 02 C	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0424992	0203-AB 03 A	2	2	--	--	--	--	--	--	--	--	98	Off-White	LB	
0424993	0203-AB 03 B	2	2	--	--	--	--	--	--	--	--	98	Off-White	LB	
0424994	0203-AB 03 C	2	2	--	--	--	--	--	--	--	--	98	Off-White	LB	
0424995	0203-AB 04 A	20	17	3	--	--	--	--	--	--	--	80	Gray	LB	
0424996	0203-AB 04 B	45	40	5	--	--	--	--	--	--	--	55	Gray	LB	
0424997	0203-AB 04 C	30	25	5	--	--	--	--	--	--	--	70	Gray	LB	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples.

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

NVLAP
NY ELAP
AIHA

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122892
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	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		
Attention:	[redacted]				

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0424998	0203-AB 05 A	NAD	--	--	--	--	--	--	--	--	3	97	Brown	LB	
0424999	0203-AB 05 B	NAD	--	--	--	--	--	--	--	--	3	97	Brown	LB	
0425000	0203-AB 05 C	NAD	--	--	--	--	--	--	--	--	3	97	Brown	LB	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

APPENDIX E

TRAINING CERTIFICATES

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

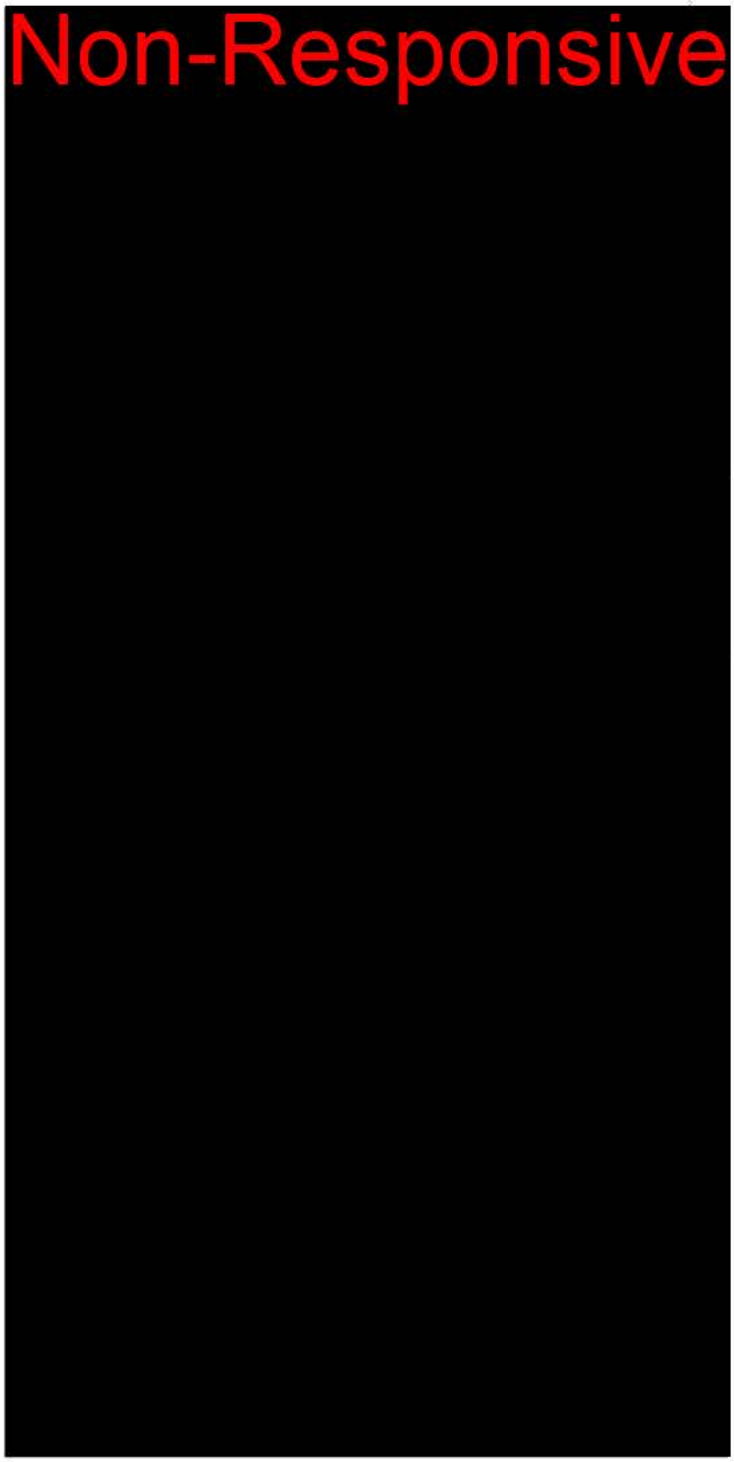
Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]



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APPENDIX F

PHOTOGRAPHS

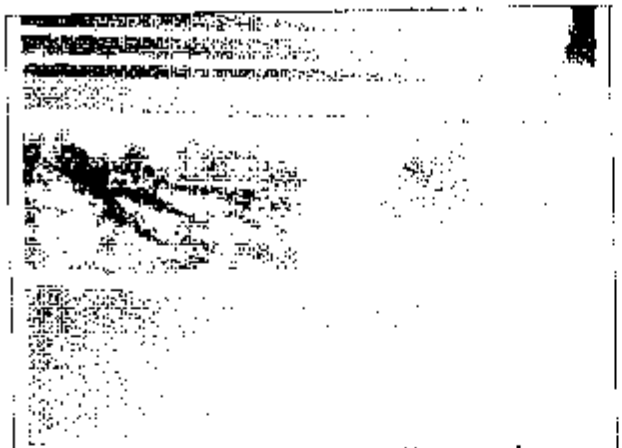

Photo 3488: Classroom #6 Damaged asbestos-containing floor tile

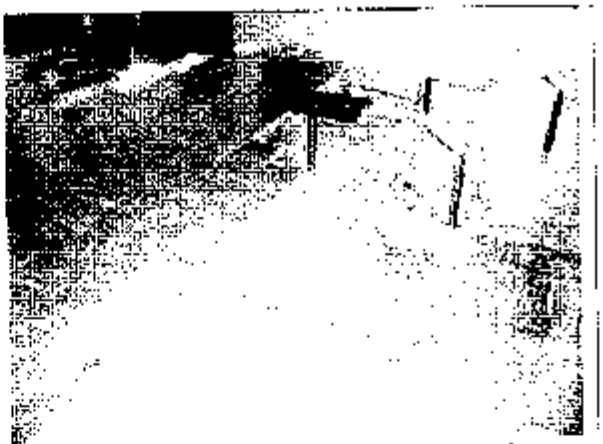

Photo 3490: Dining Area #7 Exposed asbestos-containing floor tile mastic

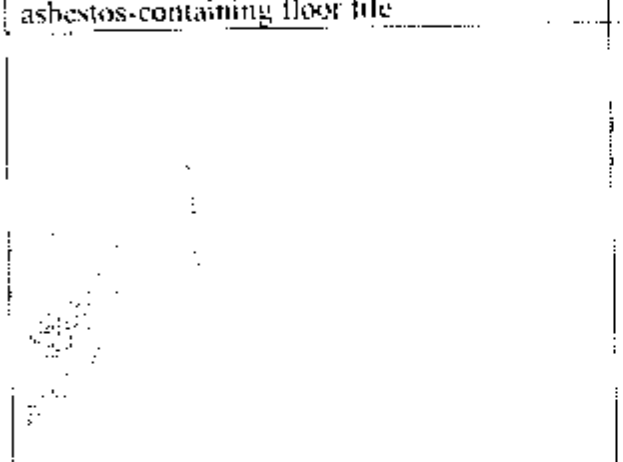

Photo 3492: Kitchen #8 Damaged asbestos-containing floor tile

Photo 3493: Ladies Shower Room #9 Poor housekeeping

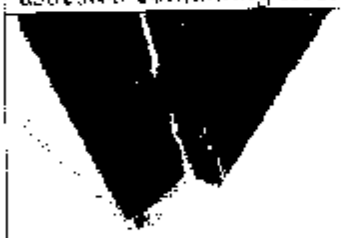

Photo 3495: Storage #13 Damaged asbestos-containing floor tile

Photo 3496: Weight Room Damaged asbestos-containing pipe insulation

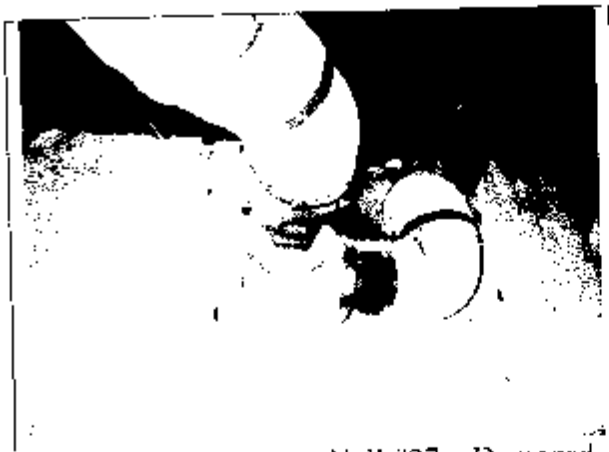

Photo 3499: Basement Hall #27 Damaged asbestos-containing pipe insulation

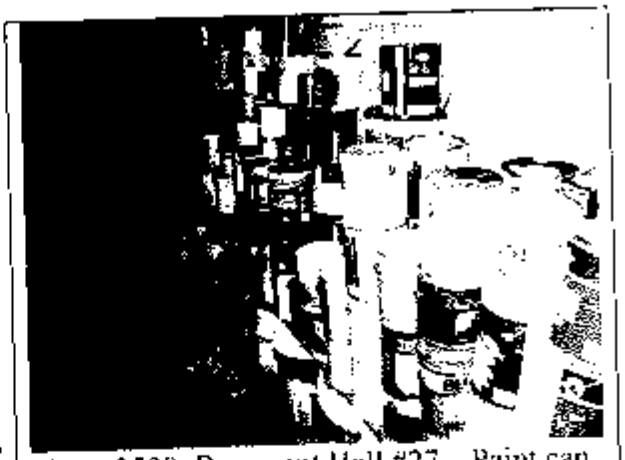

Photo 3500: Basement Hall #27 Paint can storage

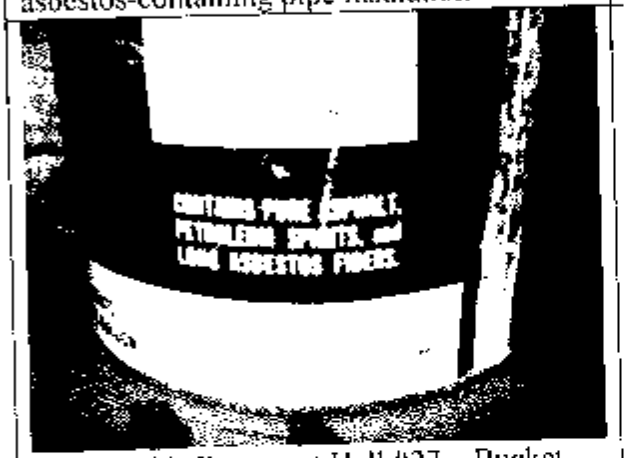

Photo 3501: Basement Hall #27 Bucket containing asbestos-containing roof tar

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of tha wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but parsonnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary maasure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

APPENDIX H

Responsibilities For Inspection, Evaluation And Operation Of ARNG Indoor Firing Ranges (IFR) And Guidelines For IFR Rehabilitation, Conversion And Cleaning

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

NGB-AVS

5 December 2001

MEMORANDUM FOR THE ADJUTANTS GENERAL OF ALL STATES, PUERTO RICO, THE US VIRGIN ISLANDS, GUAM, AND THE COMMANDING GENERAL OF THE DISTRICT OF COLUMBIA

SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

1. References:

a. AR 385-63, Policy and Procedures, 15 November 1983.

b. DODI 6055.9-STD, DOD Ammunition and Explosive Safety Standards, August 1997.

c. DODIG Report #98-170, subject: ARNG and U.S. Army Reserve Command Small Arms IFR, 30 June 1998.

d. AR 385-10, The Army Safety Program, 29 February 2000.

e. All States Memorandum, NGB-AVS, 18 September 2000, subject: (All States Log Number P00-0059) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges.

2. The policy and procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges are enclosed. Guidelines for Rehabilitation, Conversion, and Cleaning of IFRs are provided in the Addendum. These policies apply to all persons responsible for the operation, rehabilitation, conversion, and cleaning of ARNG IFR and satisfy the requirements of the references listed above.

3. The enclosed document contains sample formats of the forms necessary for the routine operation of IFRs. Additionally, an IFR Standing Operating Procedure is provided to assist each State/Territory in developing local guidance consistent with the needs of the individuals that use their range(s).

4. The contents of this memorandum will be incorporated into the revision of NGR 385-15, Policy and Responsibilities for Evaluation, and Operation of ARNG Indoor Firing Ranges, and National Guard Pamphlet 385-15, Guidance and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

NGB-AVS
SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning Inspection

5. This memorandum expires 30 November 2002, unless sooner rescinded or superseded.

6. Point of contact is Colonel Non-Responsive Chief, Aviation and Safety Division, at DSN 327-7700 or 703-607-7700.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

Non-Responsive

Encl
as

Lieutenant General, GS
Director, Army National Guard

CF:
NGB-IG
NGB-ART
NGB-ARO
NGB-ARE
NGB-ARI
NGB-ARS
NGB-PL
NGB-ARZ-PC
Each State IG
Each State Safety Office
Each State Occupational Health Nurse
Each State Training Site Commander
Each State USPFO
Each Regional Industrial Hygienist

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Contents

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Appendices
Appendix A - Abbreviations
Appendix B - References
Appendix C - Indoor Firing Range Accident Response Plan
Appendix D - Permission and Release of Liability Certificate
Addendum
Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning

1-1. General
This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

1-2. Explanation of abbreviations and terms
Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

1-3. Policy
a. Ammunition shall only be fired in properly classified indoor firing ranges.
b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
f. New ranges shall be designed using the latest standards provided by NGB-ARI.
g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

Responsibilities

1-4. Director, Army National Guard (DARNG)
The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

1-5. Chief, Aviation and Safety (NGB-AVS)
The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:
a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
b. Coordinate with other HQDA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall- -
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

1-7. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-8. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall- -

a. Provide the design standards for the construction of indoor firing ranges.

b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

1-9. The State Adjutant General
The State Adjutant General shall- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.

c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

1-10. State Safety Manager
State Safety Managers shall–

a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.

b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.

c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.

d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.

e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

f. Approve the use of the range by non-military organizations.

g. Maintain copies of all range inspections, ventilation measurements and visitors log.

1-11. State Occupational Health Nurse
The Occupational Health Nurse shall- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.

b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.

d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

1-12. State Environmental Office
The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

1-13. Facility Commanders
Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.

b. Indoor firing ranges are secured when not in use.

c. A custodian is appointed for all indoor firing ranges under his/her area of command.

d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.

e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.

f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.

g. All required signs are posted IAW Section 1-22 of this regulation.

h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.

i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).

j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.

k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.

m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.

n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).

o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter (mg/m^3).

p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.

q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.

r. The ventilation system is in operation at all times during firing or cleaning.

1-14. Range Custodians
Custodians shall- -

a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.

b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

1-15. Unit Commanders

Unit Commanders shall- -

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using **"limited use"** firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as **"limited use"** ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

1-16. Procedures, classification and use

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

1-17. Classification of ranges

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as **"safe"**, **"limited use"** or **"unsafe"**. **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in DG 415-1, Appendix A or CEHND 1110-1-18).

(1) **Safe ranges.**

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

(2) **Unsafe ranges.**

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

b. **Ventilation**

(1) **Safe ranges.**

(a) The range has an operational mechanical ventilation system.

(b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).

(c) Air is exhausted at or behind the bullet trap.

(d) Supplied air is introduced into the range behind the shooters.

(e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.

(f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.

(h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of water gauge (wg) but does not exceed -.20 wg.

(i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)

(j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.

(k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

(2) **Unsafe ranges.**

(a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.

(b) The range has no mechanical ventilation.

(c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.

(d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.

(e) Air is exhausted anywhere other than at the bullet trap.

(f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.

(g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -. 05 wg or in excess of -. 2 wg.

(h) The range is under positive pressure.

(i) The supply and exhaust air systems are not electrically interlocked.

c. **Range lighting**.

(1) **Safe ranges.**

(a) Lighting is uniform, non-glaring and does not cause shadows.

(b) Illumination is at least 100 foot candles on the targets and 30 foot- candles in all other areas.

(c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.

(d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.

(e) Emergency lights are provided behind the firing line and are in working condition.

(f) Exit lights are provided as required.

(g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

(2) **Unsafe ranges.**

(a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. **Bullet traps.**

(1) **Safe ranges.**

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.

(c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

(2) **Unsafe ranges.**

(a) Steel bullet traps are bowed, punctured or severely pitted.

(b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

e. **Targets and target carriers.**

(1) **Safe ranges.**

(a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).

(b) Only paper targets are used.

(2) **Unsafe ranges.** Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

f. **Lead levels.**

(1) **Safe ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels do not exceed 0.05 mg/m^3.

(b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed 0.03 mg/m^3.

(c) For personnel under the age of 18, see Figure 1-1.

(2) **Limited use ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels exceed 0.05 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed 0.03 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample.

(3) **Unsafe ranges.**

Lead levels in air sample results exceed 0.4 mg/m^3 in any breathing zone or general area sample.

1-18. Range use

a. Indoor firing ranges shall not be used for any purpose other than firing. (i.e., they shall not be used for classrooms, exercise rooms, storage, etc.).

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

1-19. Prohibitions

a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.

c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.

d. Variable speed fans are *not* permitted.

e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.

f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.

g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.

h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.

i. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.

j. There are no open floor drains in the range.

k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

1-20. Personal protective equipment

a. **Eye protection**. All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1999, Practice for Occupational and Educational Eye and Face Protection.

b. **Hearing protection**. All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.

c. **Respiratory protection**. For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

1-21. Posting warning signs

a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:

(1) Eating, Drinking and Smoking are *prohibited*

(2) Dry Sweeping is *prohibited*

(3) Wash Hands and Face Immediately Following Firing

(4) Only the Following Ammunition is *authorized* for use on this Range: _____

(5) Hearing Protection *shall be* properly worn during firing

(6) Proper Safety Glasses/Goggles *shall be* worn during firing

(7) Furniture or storage of other items of equipment is *not* permitted in the range

b. The following signs shall be posted on the entrance door to the range:

(1) Noise Hazardous Area

(2) Danger Lead Hazard Area

(3) Pregnant women are *not* permitted in this area.

c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.

e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

Note: All signs shall meet the requirements of DA Pam 385-64.

1-22. Range Standing Operating Procedures.

a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

(a) Name and age of shooter.

(b) Organizations (if civilian, include address and phone number).

(c) Sign-in and sign-out times and date.

(d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

1-23. Inspection requirements.

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

1-24. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

1-25. Annual inspections

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

1-26. Ventilation requirements

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

1-27. Air sampling requirements

a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m^3 sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(ii).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

1-28. Inspection reports

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

1-29. Record maintenance

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

1-30. Control of potential Lead intoxication

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

(1) A description of each operation where Lead is emitted;
(2) Methods used to achieve compliance;
(3) Methods used to meet the permissible exposure level;
(4) Air monitoring data, which documents the source of air emissions;
(5) A detailed schedule for implementation of the program;
(6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
(7) Administrative control schedule;
(8) Personnel enrollment in medical surveillance;
(9) Other relevant information.

b. Refer to TG 206 for specific guidance on developing the compliance program.

1-31. Alternative ammunition

a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

1-32. Maintenance requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline static pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

(5) Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

1-33. Housekeeping

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are ¾ full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

1-34. Maximum exposure hours
Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m^3 or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed 0.03 mg/m^3. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

1-35. Extent of use
a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m^3. For ranges with Lead concentrations less than 0.100 mg/m^3, follow the guidelines in Figure 1-1.
d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

1-36. Medical surveillance
a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m^3) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

1-37. Terms
a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

FIGURE 1-1

0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 – 0.499	0.75	0.5	0
0.500 – 0.749	0.5	0.25	0
0.750 – 0.999	0.25	0.25	0
1.000 or above	0	0	0

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range _____ Date _____

Range Custodian _____ Telephone _____

Part 1, Physical Safety Inspection

A. Building Envelope

_____ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]

_____ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17a(1)(d)]

_____ 4. There are no open floor drains in the range. [1-17a(2)(c)]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]

_____ 7. The interior surfaces of the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]

_____ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]

_____ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))

_____ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))

_____ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))

_____ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]

_____ 6. Exit lights are provided and working as required. [1-17c(1)(f)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, the Addendum, and this regulation. [1-17d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]

_____ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]
(Any one firing lane without a retrieval system shall not be used for firing)

_____ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]

_____ 3. Only paper targets are used in the range. [1-17e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [1-18a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]

_____ 3. No additional clothing or equipment is brought into the range. [1-19h]

_____ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-19a]

_____ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]

_____ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]

_____ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

F. Range maintenance

_____ 1. Dry sweeping does not occur in the range. [1-19e]

_____ 2. No brooms are located in the range. [1-19e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
- _____ a. Eating, Drinking and Smoking are *Prohibited*
- _____ b. Dry Sweeping is *Prohibited*
- _____ c. Wash Hands and Face Immediately Following Firing
- _____ d. The Following Ammunition is authorized for use on this Range: _____
- _____ e. Hearing Protection *shall be* Properly worn during firing
- _____ f. Proper Safety Glasses/Goggles *shall be* worn during firing
- _____ g. No Furniture or Storage of Items Permitted in the Range

_____ 2. The following signs are posted on the entrance door to the range: [1-21b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant women are *not* permitted in this Area

_____ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters. [1-21c]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

_____ 2. The range SOP includes as a minimum the following: [1-22b]

_____ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

_____ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

_____ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

_____ d. Instructive guidance for all range procedures.

_____ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

_____ f. Authorized ammunition for the range.

_____ g. The requirement for posting of signs IAW section 1-21 of this regulation.

_____ h. Cleaning and maintenance requirements.

_____ i. Personal protective equipment requirements for maintenance, firing and cleaning.

J. Recordkeeping

_____ 1. A visitors log is maintained which includes the following information for all visitors/shooters: [1-14c]

_____ a. Name and age of shooter.

_____ b. Organization (if civilian, include address and phone number).

_____ c. Sign in and sign out times.

_____ d. Type of ammunition used and number of rounds fired.

_____ 2. Copies of initial and other previous inspections are available. [1-24a]

_____ 3. The initial inspection report includes air-sampling data. [1-24b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

_____ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

_____ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

_____ 7. Range safety officer(s) is/are designated. [1-13c]

K. New and Renovated Ranges

_____ 1. No doors are installed in the plenum wall.

_____ 2. Plenum area is at least 4 feet deep.

_____ 3. An access door is installed behind the bullet trap.

_____ 4. Only escalator or rubber bullet traps are installed.

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 2, Ventilation Inspection

A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]

_____ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]

_____ 4. Make-up air is introduced into the range behind the shooters. (1-17b(1)(d)]

_____ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 800 fpm. [1-17b(1)(e)]

_____ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 800 fpm. [1-17b(1)(f)]

_____ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]

_____ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]

_____ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii)]

_____ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails.
[29 CFR 1910.1025(e)(4)(ii)]

_____ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, 3-2a]

_____ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]

_____ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]

_____ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]

_____ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

B. New and Renovated Ranges

_____ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.

_____ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.

_____ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 4. Passive supply systems have opposing blade louvers.

_____ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____

2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____

3. Air sampling has been scheduled for: _____

Print and sign: _____

Position: _____ Date: _____

4. Air sampling was completed on: _____ for the following types of ammunition: _____.

5. Air sample results do not exceed: _____ mg/m^3 (results are attached)

6. For military personnel exposed less than 30 days per year, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

Print and sign: _____

Position: _____ Date: _____

FIGURE 1-3
EXAMPLE OF INDOOR FIRING RANGE SOP
STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXXX
_____ ARMORY INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

1. **References:**

a. AR 385-10
b. AR 385-63
c. NGR 385-10
d. NG PAM 385-XX
e. 29 CFR 1910.1025
f. 29 CFR 1920.1200
g. 29 CFR 1926
h. 29 CFR 1960
I. USACHPPM, TG 141

2. **Purpose.** The _____ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

3. **Review and Update.** This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

4. **General.**

a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.

b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

5. **Range Control.**

a. The _____ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

(1) Enforce the facility range safety program and SOP.

(2) Notify Armory personnel of times when the range shall be in use.

(3) Coordinate and schedule all activity on the firing range.

(4) Ensure that the range is secured when not in use.

(5) Ensure that nothing is stored at the range.

(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Sate Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCOIC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (**Appendix C** of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paregraph 1-21 are posted as required.

6. **Range OIC/NCIOC.** The Commander or supervisor of all using units or groups shall designate an OIC/NCOIC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range heve singed-in on the roster maintained by the facility Commander.

(10) Ensure that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from _____ to _____ hours.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.

(3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.

(4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.

(5) Ensure that weapons are cleared and checked during temporary suspension of firing.

(6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

c. After Firing.

(1) Ensure that all weapons are cleared prior to being removed from the firing line.

(2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

(3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**

(4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

7. **Range Control Officer Qualifications.** His or her commander may appoint any individual in the rank of E-6 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

8. **Range Restrictions.**

a. The _____ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

EXAMPLE

(1) .22 caliber including the M-16 with adapter
(2) .38 caliber
(3) .45 caliber
(4) 9 mm pistols

Note: No other weapons can be fired without the approval of the State Safety Manager.

b. Pellets, BBs, magnum and armor piercing rounds are prohibited.

c. Dry sweeping of the range is prohibited.

d. Trick shooting including, quick draw and hip shooting is prohibited.

e. Storage of any item in the range is prohibited.

f. Smoking and consumption of food or beverages is prohibited.

g. Proper hearing and eye protection shall be worn during firing.

h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.

i. Personnel shall not be allowed in the observation/plenum area during firing.

9. **Mandatory Signs.** As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

(1) Eating, drinking and/or smoking are prohibited.

(2) Dry sweeping is prohibited.

(3) Wash hands and face immediately after firing.

(4) Hearing protection shall be worn during firing.

(5) Safety glasses/goggles shall be worn during firing.

(6) Storage of furniture and other items is prohibited.

(7) The following ammunition is authorized for this range: _____, _____, _____, and _____.

b. On the Door to the Range.

(1) Noise Hazardous Area.

(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

10. **Authorized Use of the Range.** Utilization of the _____ Armory range is authorized for organizations of the _____ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of _____.

11. **Release of Liability.**

a. The military Range Control Officer shall obtain a signed Release of Liability (**Appendix D** of this SOP) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (**Appendix D** of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

12. **Denial of Range Access.** The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe
CPT, IN, ___ARNG
OIC/Armory Commander

APPENDIX A
ABBREVIATIONS

ANSI
American National Standards Institute

AR
Army Regulation

ARNG
Army National Guard

CFM
Cubic feet per minute

CFR
Code of Federal Regulations

CNGB
Chief, National Guard Bureau

DA
Department of the Army

FPM
Feet Per Minute

HEPA
High Efficiency Particulate Air

IAW
In Accordance With

IFR
Indoor Firing Range

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standing Operating Procedure

SP
Static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

wg
Inches of water gauge

APPENDIX B
REFERENCES

ACGIH 22nd Ed, Industrial Ventilation
A Manual of Recommended Practice

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 350-41
Army Forces Training

AR 385-63
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64
U.S. Army Explosives Safety Program

Army National Guard (ARNG) Design Guide (DG) 415-1
Design Guide for Armories

American National Standards Institute (ANSI) Z87.1-1989
Practice for Occupational and Educational Eye and Face Protection

CEHND 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

Department of the Army Pamphlet (DA PAM) 385-64
U.S. Army Explosives Safety Program

DA PAM 40-501
Hearing Conservation

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges

FM 25-7
Training Ranges

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development

APPENDIX B (Continued)

GR 420-10
Operations/Maintenance and Minor Construction, Army National Guard

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TG 206
USACHPPM Technical Guide for Indoor Firing Ranges

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910
Occupational Safety and health Standards

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX C
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. All weapons shall be cleared and muzzles pointed downrange.

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. The primary telephone to be used in case of an emergency is located _____. The emergency numbers are _____.

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN _____, or the duty officer, and the State Safety and Occupational Health Office at DSN _____.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

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SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX D
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

_____ ARNG
Somewhere, USA
Date: _____

BE IT KNOWN TO ALL: WHEREBY I, _____;
Have been granted permission to use firearms on the indoor firing range located at the _____ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of ____ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of ____, the ____ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of ____, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: _____

Witness to Signature: _____

In case of emergency, please contact:

Name _____
Address _____
_____
Telephone Number _____

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.

I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: _____

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References

Related publications are listed below.

a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (PREFERRED METHOD)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman™ #40 paper.

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Expresa 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
LEOMINSTER ARMORY
OAK STREET
LEOMINSTER, MASSACHUSETTS

July 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont)

Section **Page**

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the recruiter's office was inadequate.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the former the firing range in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Damaged asbestos-containing pipe fitting insulation in the entryway at storage #1 and in the former firing range.	Repair or remove asbestos-containing floor tile and tank insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
No site specific asbestos operations and maintenance plan available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Armory located an Oak Street in Leominster, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 12, 2004, Mr Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Leominster, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive of the Commonwealth of Massachusetts National Guard was Mr. Non-Responsive site contact for this survey. At the time of the survey the unit was deployed to Iraq and there were no full-time employees available.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

The administration area includes offices, a classroom, the kitchen, storage areas and the latrines. Asbestos-containing materials, in the form of floor tile located throughout the building, were in good condition. Paint throughout the administrative area was also in good condition. There was no evidence of water leaks and URS' point of contact expressed no concerns regarding indoor air quality, ergonomics or lighting.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey averaged of 16.2%. This average reading was below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide concentrations averaged 435 parts per million (ppm). Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above background level. For instance, given a background level of 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. The carbon monoxide concentration remained at 0 parts per million (ppm) throughout the survey period. This measured level was below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting)

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (foot candles)	Recommended Illuminance (foot candles)
Recruiter's Office	Administrative Duties	27	50
Storage Room #1	Storage	65	30

On the day of the survey the illuminance in the recruiter's office was inadequate.

2.2.5 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing pipe fitting insulation (Photo # 0004) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-2 below presents the results of the sample analysis.

Table 2-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Entry Near Storage #1	Pipefitting Insulation	0212-20A	45 (chrysotile)

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

LIGHTING: On the day of the survey, the illuminance in the recruiter's office was inadequate. URS recommends increasing luminance through task lighting. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Dust wipe samples analyzed for lead content were all below the allowable limit of 200 micrograms per square foot established by the National Guard Bureau (See Appendix G).

ASBESTOS: Damaged asbestos-containing pipe fitting insulation is located in the entryway by storage #1. A licensed Commonwealth of Massachusetts Asbestos Abatement Contractor should repair this material.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Bullet Trap – Floor	0212-04	1.000	230	200
Former Firing Range-Firing End – Floor	0212-05	1.000	61	200
Blank	0212-09	N/A	<12	200

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0212-02	258	<12	50.0
Blank	0212-03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29

CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing pipe fitting insulation in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 3-3 below presents the results of the sample analysis.

Table 3-3
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Former Firing Range – Center	Pipefitting Insulation	0212-20B	45 (chrysotile)
Former Firing Range - South	Pipefitting Insulation	0212-20C	55 (chrysotile)

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Two surface dust wipe samples were collected and one of the two was above the 200 micrograms per square foot allowable limit set by the National Guard Bureau (See Appendix F). URS recommends this area be cleaned by individuals trained in accordance with the OSHA lead standard (29 CFR 1910.1025). The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the clean-up and rehabilitation of former indoor firing ranges are contained in Appendix H.

ASBESTOS: There are five to six pipe fittings with damaged asbestos-containing insulation located in the former firing range. URS recommends that this material be either removed or repaired by a licensed Commonwealth of Massachusetts Asbestos Abatement Contractor.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is used for assembling personnel and storing equipment. The walls are constructed of cinder-block with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lighting

Lighting in the drill hall was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 4-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting)

Table 4-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux)	Recommended Illuminance (lux)
Drill Hall Center	Assembly, Storage	29	30

On the day of the survey the illuminance in the drill hall was inadequate.

4.2.2 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-2 below shows the results of the lead sampling.

Table 4-2
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall –Former Firing Range Entry	0212-06	1.000	140	200
Drill Hall – Center	0212-07	1.000	110	200
Drill Hall – Kitchen Entry	0212-08	1.000	97	200
Blank	0212-09	N/A	<12 µg	N/A

One air sample for lead dust was collected in the drill hall. Table 4-3 below shows the result of this air sample.

Table 4-3
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0212-01	264	<11	50.0
Blank	0212-03	N/A	<3.0 μg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LIGHTING: Lighting in the drill hall was adequate on the day of the survey.

LEAD: The dust wipe samples collected in the drill hall had levels of lead below the 200 micrograms per square foot allowable limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix G).

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Asbestos-containing materials and presumed asbestos-containing materials are in good condition and did not require sampling.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Since the building was built in 1960, thermal system insulation, including pipe and boiler insulation, must be presumed as asbestos-containing. These materials were in good condition and do not require repair or removal.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

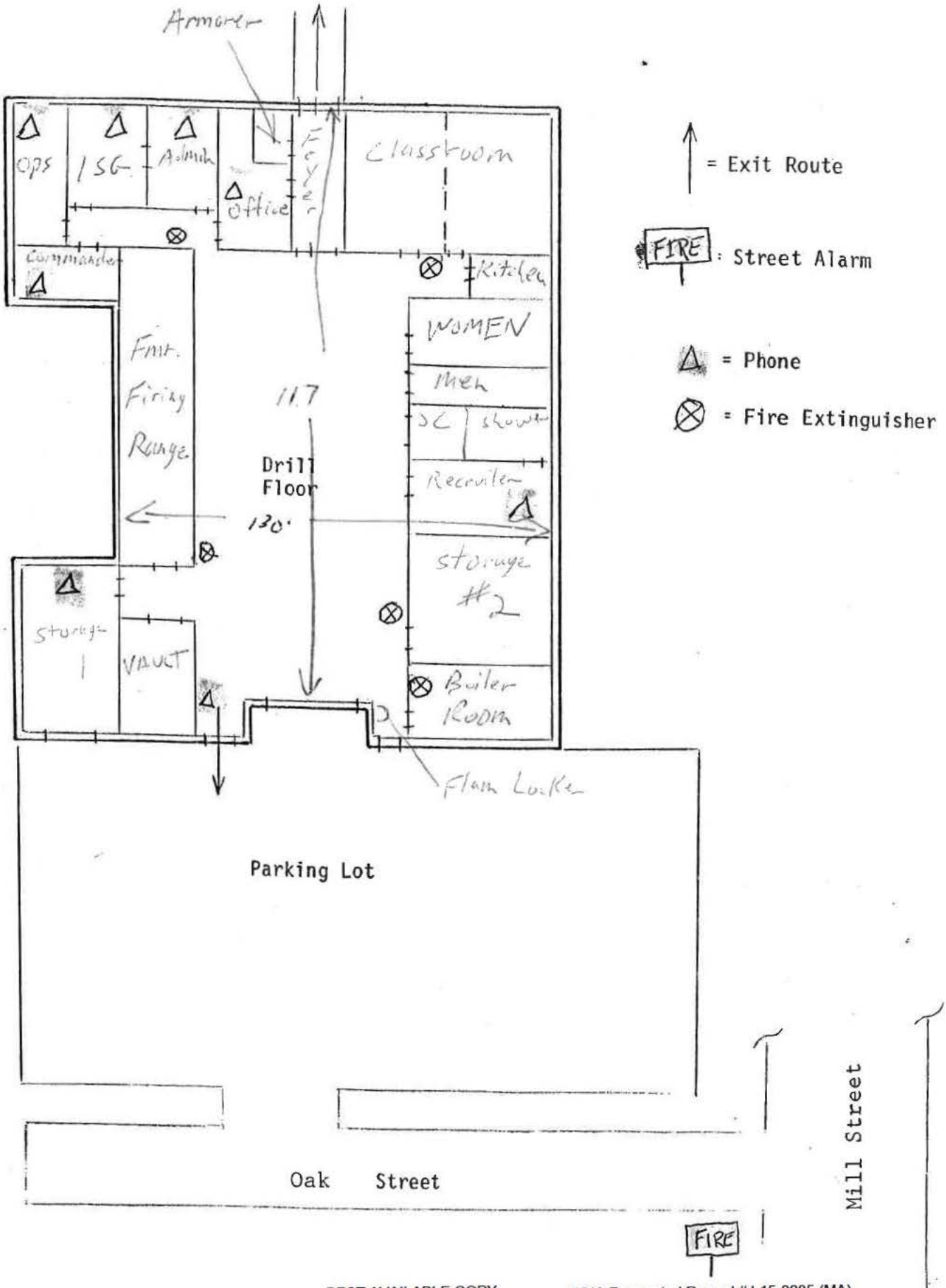
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

ARMORY DRAWING



APPENDIX B

PERSONNEL LIST

NO STAFF ON SITE

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	128494
Address:	301-1H Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Leominster, MA	**Date Analyzed:**	06/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	16-Jun-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0451571	021B-01	Flame	Air	293	N/A	10.24	ug/m³	<	10	ug/m³	
0451580	0212-04	Flame	Wipe	****	1.000	12.00	ug/ft²		230	ug/ft²	
0451581	0212-05	Flame	Wipe	****	1.000	12.00	ug/ft²		61	ug/ft²	
0451582	0212-06	Flame	Wipe	****	1.000	12.00	ug/ft²		140	ug/ft²	
0451583	0212-07	Flame	Wipe	****	1.000	12.00	ug/ft²		110	ug/ft²	
0451584	0212-08	Flame	Wipe	****	1.000	12.00	ug/ft²		97	ug/ft²	
0451585	0212-09	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0451586	0212-01	Flame	Air	264	N/A	11.36	ug/m³	<	11	ug/m³	
0451587	0212-02	Flame	Air	258	N/A	11.63	ug/m³	<	12	ug/m³	
0451588	0212-03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable   mg/Kg = parts per million (ppm) by weight   mg/L = parts per million (ppm)

%Pb = percent lead by weight   ug = micrograms   ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	Job Name:	Armory	Chain Of Custody:	128494
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	Job Location:	Leominster, MA	Date Analyzed:	06/16/2004
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0451589	0212-20 A	45	45	--	--	--	10	--	--	--	--	45	Gray	PC	
0451590	0212-20 B	45	45	--	--	--	5	--	--	--	--	50	Gray	PC	
0451591	0212-20 C	55	55	--	--	--	3	--	--	--	--	42	Gray	PC	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
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APPENDIX E

TRAINING CERTIFICATES

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Non-Responsive

Certificate of Training

Awarded to

[redacted]

For successful completion of an 8 Hour, 1 Day

Asbestos Inspector & Management Planner

Annual Refresher Training

MARCH 25, 2003

This training was approved and given in accordance with
Regulations for Connecticut State Agencies
RCSA 20-440 - 1-9 and RCSA 20-441 and meets the
requirements of the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: IMPR10543 | Exam Grade: 100% | Expiration Date: 03/25/2004

Exam Date: 03/25/2003

[redacted] H, CSP, RS

[redacted] aining Director

APPENDIX F

PHOTOGRAPHS

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Photo 0001: Former Firing Range

Photo 0002: Former Firing Range

Photo 0003: Drill Floor

Photo 0004: Former Firing Range – Asbestos –containing pipe fitting insulation

Photo 0005: Drill Floor

Photo 0006 Drill Floor

Photo 0007: Drill Floor at Kitchen

Photo 0008: Drill Floor

Photo 0009: Operations Room – Asbestos-containing floor tile

Photo 0010:Administrative Office – Asbestos-containing floor tile

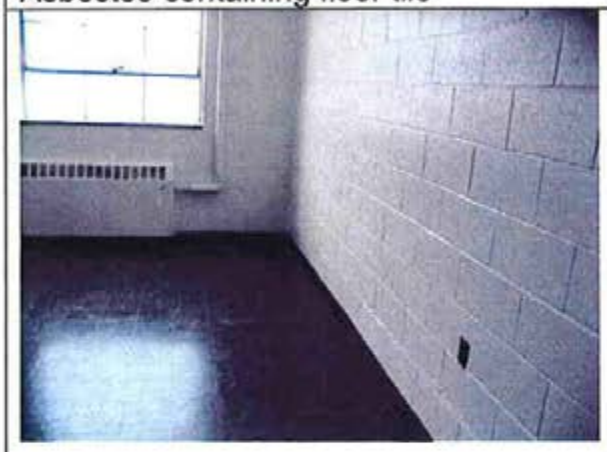


Photo 0011: Classroom – asbestos-containing floor tile

Photo 0012: Storage Room

Photo 0013: Boiler Room

Photo 0015: Exterior view

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be Instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address			Point of Contact *(name & phone #)* Samples Collected By
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Leominster Readiness Center
21 Oak Street
Leominster, MA 01453-3310

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: July 26, 2010
Report Date: September 21, 2010

AEI Project #: J10-513 3a MA Leominster RC

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 21 Oak Street, Leominster, MA, 01453-3310. Non-Responsive performed the evaluation on July 26, 2010. The point of contact for the facility was Staff Sergeant Non-Responsive The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) evaluations of operations including operation description, ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Noise Hazards: No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

Lead in Air Samples: Results of collected air samples were below regulatory limits for lead (50 $\mu g/m^3$).

Paint Chip and Wipe Samples for Lead Contamination: Results of dust wipe samples taken throughout the facility including the former firing range indicated one wipe sample collected from the top of the flammable cabinet outside the arms vault was above the National Guard criteria for lead contamination (200 $\mu g/ft^2$). No peeling or flaking paint was observed at the Leominster Readiness Center.

Visual Inspection for Damaged Asbestos-Containing Materials: One damaged TSI pipe fitting was observed in the caged storage area. The bulk sample of the material resulted in trace amounts of Chrysotile, 8% Amosite and 2% Crocidilite asbestos.

Visual Inspection for Water Damage and Mold Growth: No visual evidence of water damage or mold growth was observed in the facility.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. All areas were clean and tidy.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated that there are some illumination deficiencies in six (6) offices. The illumination measurements indoors ranged from a low of 2.7 foot candles (fc) to a high of 89.6 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of CO_2 ranged from 338 to 556 parts per million (ppm) and outdoor CO_2 levels were approximately 390 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange. Indoor levels of CO ranged from 0.1 to 0.8 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 21 Oak Street, Leominster, MA 01453. Non-Responsive performed the evaluation on July 26, 2010. The point of contact for the facility was Staff Sergeant Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Leominster Readiness Center is staffed with 3 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Leominster Readiness Center consisted of visual inspections, interviews with employees and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and IAQ survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Leominster facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Leominster facility expired in 2006 and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

To determine if any airborne contamination of lead existed in the facility, air sampling for lead was conducted in one office and the drill hall and analyzed by AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Lead in Air Sampling for the MA ARNG Leominster Readiness Center on July 26, 2010.

Air Sample #	Sample Location	Result (µg/m³)*
LEO-01	Office, On Desk	<6.8
LEO-02	Drill Hall, North Side	<6.8

*The OSHA PEL for Lead in Air is 50 µg/m³.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No areas of peeling or flaking paint were observed.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10cm x 10cm templates. Wipe samples for surface dust were collected in 10 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts limits for lead in dust are 40 micrograms per square foot (µg/ft²) on floors, 250 µg/ft² on window sills, and 400 µg/ft² in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) recommended maximum level for adult exposures of 200 µg/ft² on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. One wipe sample collected from the top of the flammable cabinet outside the arms vault was above the National Guard criteria for lead contamination (200 µg/ft²). Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for MA ARNG Leominster Readiness Center on July 26, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
LEO-PB-01	Office 2, Supply Air Grill	<110
LEO-PB-02	Kitchen, Supply Counter	<110
LEO-PB-03	Assembly Hall, Top of Bench	<110
LEO-PB-04	Assembly Hall, Middle of Floor	<110
LEO-PB-05	Assembly Hall, On Top of Locker in NE Corner	180
LEO-PB-06	Hallway 5, From Air Vent	<110
LEO-PB-07	Foyer Outside Room 16, From Floor	<110
LEO-PB-08	Foyer Outside Vault, From Top of Flammable Cabinet	**280**
LEO-PB-09	Foyer Outside Cage Room, From Floor	<110
LEO-PB-10	Entryway Room 7, Floor Immediately in Front of Door	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there were any damaged suspect asbestos-containing materials. One damaged TSI pipe fitting was observed in the caged storage area. Samples were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM) using EPA method 600/R-93/116. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The bulk sample of the material resulted in trace amounts of Chrysotile, 8% Amosite and 2% Crocidilite asbestos. Results are given in Table 3 and certificates of analysis are included in Appendix B.

Table 3 – Results of Asbestos Sampling for the MA ARNG RC Agawam, MA on July 26, 2010.

Bulk Sample #	Sample Location	Result (%)
LEO-ASB-01	Damaged Elbow in Cage Room	Trace Chrysotile, 8% Amosite, 2% Crocidilite

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. There was some evidence of old water damage on the drill hall ceiling was observed but no mold growth was observed at the facility.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. All areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2009, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated that there are some illumination deficiencies in six (6) offices. The illumination measurements indoors ranged from a low of 2.7 foot candles (fc) to a high of 89.6 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a factory calibrated TSI Q-Trak Plus Model 7565X. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2004. These ranges are presented in Table 4. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix G with the lighting survey measurements.

Table 4 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2004

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 75 to 82.3° F and 41.7 to 56.6% Rh. Outdoor temperature and humidity measurements were 78.5° F and 49.8% on the day of monitoring. Temperatures and relative humidity measurements were

outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Those areas with window air conditioning units were within acceptable ranges.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 338 to 556 parts per million (ppm) and outdoor CO_2 levels were approximately 390 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2007 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.8 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling lead-based paints, noise hazards, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: surface contamination of lead dust, the presence of damaged suspect asbestos-containing materials, indoor air quality and lighting. Overall, Leominster Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

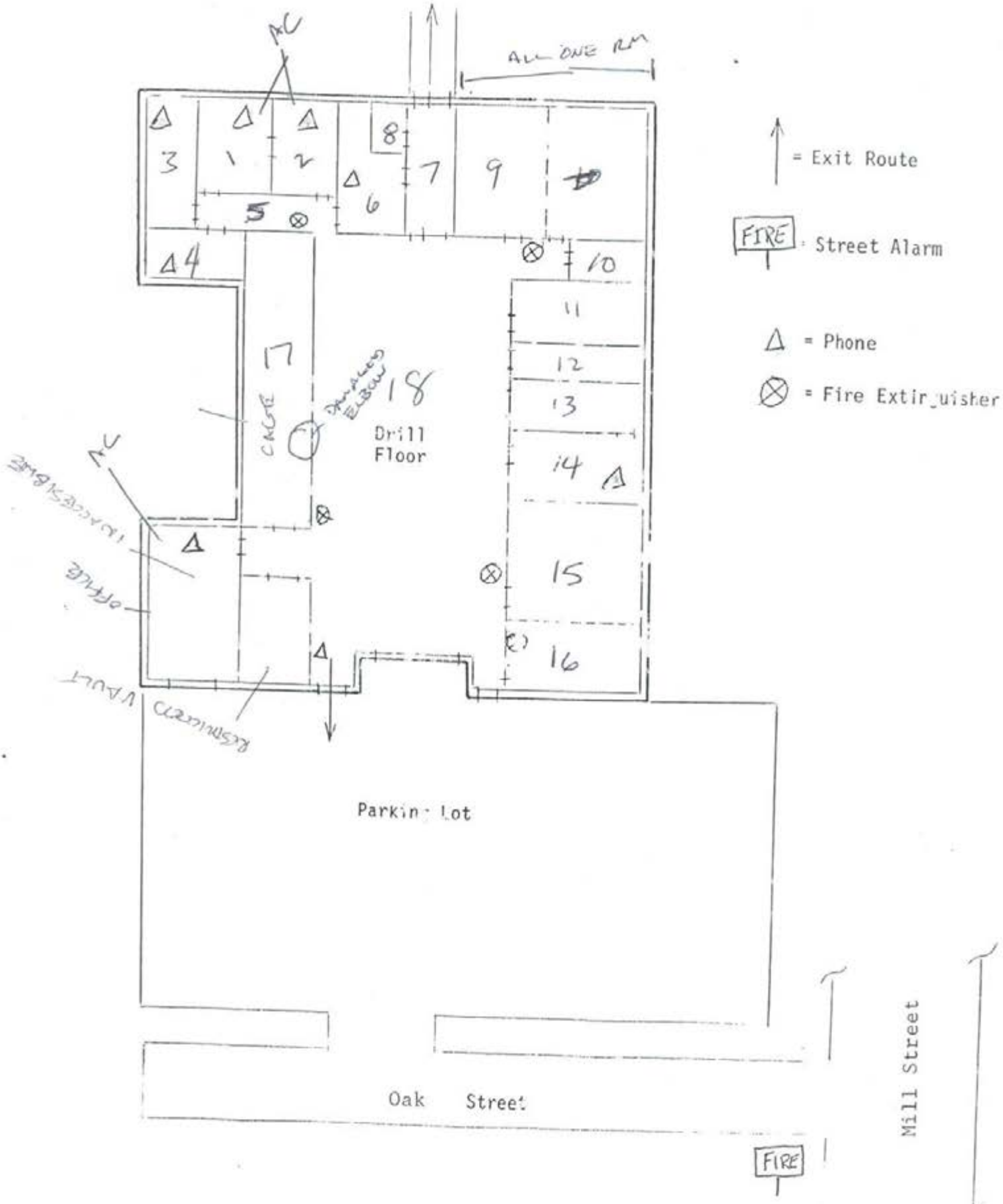
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in

accordance with local, sate, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, “Ventilation for Acceptable Indoor Air Quality” and Standard 55-2004, “Thermal Environmental Conditions for Human Occupancy”.
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout



BEST AVAILABLE COPY

Appendix B
Certificates of Analysis for Air, Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Leominster Armory	**Chain Of Custody:**	508460		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Leominster, MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/9/2010	**Report Date:**	8/9/2010

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
1066394	Leo-01	Flame	Air	439	N/A	6.8	ug/m^3	<3	<6.8	ug/m^3	
1066395	Leo-02	Flame	Air	440	N/A	6.8	ug/m^3	<3	<6.8	ug/m^3	
1066396	Leo-Pb-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066397	Leo-Pb-02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066398	Leo-Pb-03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066399	Leo-Pb-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066400	Leo-Pb-05	Flame	Wipe	****	0.108	110	ug/ft^2	19	180	ug/ft^2	
1066401	Leo-Pb-06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066402	Leo-Pb-07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066403	Leo-Pb-08	Flame	Wipe	****	0.108	110	ug/ft^2	31	280	ug/ft^2	
1066404	Leo-Pb-09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
1066405	Leo-Pb-10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

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LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Leominster Armory	**Chain Of Custody:**	508460		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Leominster, MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/9/2010	**Report Date:**	8/9/2010

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these sampes.
NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **508460**

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: LEOMINSTER ARMORY PV2
2. Job Location: LEOMINSTER MA
3. Job #:
4. Contact Person: Non-Responsive
5. Submitted by:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Final Report Sheet with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ Email: Non-Responsive
Comments:	☐ 2 Day Date Due:	☐ Fax: @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Verbal: @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 1 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Metals Analysis
- ☐ Pb Paint Chip (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 10 (QTY)
- ☒ Pb Air 2 (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
- ☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
- ☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
- ☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
LEO-01		7/24/10	4388.6					X		X						
LEO-02			440							X						
LEO-PB-01				10X10cm								X				
LEO-PB-02																
LEO-PB-03																
LEO-PB-04																
LEO-PB-05																
LEO-PB-06																
LEO-PB-07																
LEO-PB-08																
LEO-PB-09																
LEO-PB-10																

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

Non-Responsive

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 10/2/10 1030 Via: By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 50646 PAID

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: LEOMINSTER ARMORY
2. Job Location: LEOMINSTER MA
3. Job #:
4. Contact Pe
5. Submitted

Non-Responsive

Reporting Information (Results will be provi

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	❑ Next Day ❑ 5 Day +	☒ Email: Non-Responsive us.army.mil
Comments:	❑ 2 Day Date Due:	❑ Fax:
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ Ve us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ❑ NIOSH 7400 (QTY)
- ❑ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ❑ AHERA (QTY)
- ❑ NIOSH 7402 (QTY)
- ❑ Other (specify) (QTY)

PLM Bulk
- ❑ EPA 600 – Visual Estimate (QTY)
- ❑ EPA Point Count (QTY)
- ❑ NY State Friable 198.1 (QTY)
- ❑ Grav. Reduction ELAP 198.6 (QTY)
- ❑ Other (specify) (QTY)

MISC
- ❑ Vermiculite
- ❑ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ❑ ELAP 198.4/Chatfield (QTY)
- ❑ NY State PLM/TEM (QTY)
- ❑ Residual Ash (QTY)

TEM Dust
- ❑ Qual. (pres/abs) Vacuum/Dust (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 (QTY)
- ❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ❑ Qual. (pres/abs) (QTY)
- ❑ ELAP 198.2/EPA 100.2 (QTY)
- ❑ EPA 100.1 (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples ℃)

Metals Analysis
- ❑ Pb Paint Chip (QTY)
- ❑ Pb Dust Wipe (wipe type) (QTY)
- ❑ Pb Air (QTY)
- ❑ Pb Soil/Solid (QTY)
- ❑ Pb TCLP (QTY)
- ❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ❑ Spore-Trap (QTY) ❑ Surface Vacuum Dust (QTY)
- ❑ Surface Swab (QTY) ❑ Culturable ID Genus (Media) (QTY)
- ❑ Surface Tape (QTY) ❑ Culturable ID Species (Media) (QTY)
- ❑ Other (Specify) (QTY)

SAMPLE INFORMATION					ANALYSIS							MATRIX						CLIENT CONTACT
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ITEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER (DW, GW, OTHER)	STORE TRAP	TAPE	SWAB	(LABORATORY STAFF ONLY)
LEO-ASB-01		7/26/16					X				X						Date/Time: Contact: By:
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY:

1. Date/Time RCVD: / / @ Via: By (Print):
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / FAX
4. Comments:

Non-Responsive

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Leominster Armory	**Chain Of Custody:**	508460
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Leominster, MA	**Date Analyzed:**	8/9/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
1066406	Leo-ASB-01	10	TR	8	2	--	20	--	--	--	--	60	Off-White	Homogeneous	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Direct[redacted] Non-Responsive alyst(s) Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **508460**

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: LEOMINSTER ARMORY
2. Job Location: LEOMINSTER MA
3. Job #: PO #: W912K6-09-A-0003 [redacted]
4. Contact Pers[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ____ ☐ 24 Hours Time Due: ____ Comments: ____	☐ Immediate ☐ 3 Day ☐ Next Day ☒ 5 Day + ☐ 2 Day Date Due: ____ ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Include COC/Field Data Sheets with Report ☒ Em[redacted]@us.army.mil ☐ Fax[redacted]@us.army.mil ☐ Ver[redacted]

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ____ (QTY)
- ☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ____ (QTY)
- ☐ NIOSH 7402 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate / (QTY)
- ☐ EPA Point Count ____ (QTY)
- ☐ NY State Friable 198.1 ____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield ____ (QTY)
- ☐ NY State PLM/TEM ____ (QTY)
- ☐ Residual Ash ____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
- ☐ Quan. (s/area)Dust D6480-99 ____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ____ (QTY)
- ☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted.
TEM Water samples ____ °C)

Metals Analysis
- ☐ Pb Paint Chip ____ (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 10 (QTY)
- ☒ Pb Air 2 (QTY)
- ☐ Pb Soil/Solid ____ (QTY)
- ☐ Pb TCLP ____ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
- ☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
- ☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
- ☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
- ☐ Other (Specify ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
LEO-01		7/22/10	438.6					X		X							Date/Time: Contact: By:
LEO-02			440							X							
LEO-PB-01				10X10cm								X					
LEO-PB-02																	
LEO-PB-03																	Date/Time: Contact: By:
LEO-PB-04																	
LEO-PB-05																	
LEO-PB-06																	
LEO-PB-07																	Date/Time: Contact: By:
LEO-PB-08																	
LEO-PB-09																	
LEO-PB-10																	

LABORATORY STAFF ONLY (CUSTODY)
1. Date/Time RCVD: 06-2-10 1030 Via: [redacted]
2. Date/Time Analyze[redacted] By (Print):
3. Results Reported T[redacted] AVAILABLE
4. Comments: ____

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 50646

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: LEOMINSTER ARMORY
2. Job Location: LEOMINSTER MA
3. Job #: [redacted]
4. Contact Perso[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due: ____	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due: ____	❑ Next Day ❑ 5 Day +	☒ En[redacted]
Comments: ____	❑ 2 Day Date Due: ____	❑ Fa[redacted]us.army.mil
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ Ve[redacted]us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ❑ NIOSH 7400 ____ (QTY)
- ❑ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ❑ AHERA ____ (QTY)
- ❑ NIOSH 7402 ____ (QTY)
- ❑ Other (specify ____) ____ (QTY)

PLM Bulk
- ❑ EPA 600 – Visual Estimate ____ (QTY)
- ❑ EPA Point Count ____ (QTY)
- ❑ NY State Friable 198.1 ____ (QTY)
- ❑ Grav. Reduction ELAP 198.6 ____ (QTY)
- ❑ Other (specify ____) ____ (QTY)

MISC
- ❑ Vermiculite
- ❑ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ❑ ELAP 198.4/Chatfield ____ (QTY)
- ❑ NY State PLM/TEM ____ (QTY)
- ❑ Residual Ash ____ (QTY)

TEM Dust
- ❑ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
- ❑ Quan. (s/area)Dust D6480-99 ____ (QTY)

TEM Water
- ❑ Qual. (pres/abs) ____ (QTY)
- ❑ ELAP 198.2/EPA 100.2 ____ (QTY)
- ❑ EPA 100.1 ____ (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- ❑ Pb Paint Chip ____ (QTY)
- ❑ Pb Dust Wipe (wipe type ____) ____ (QTY)
- ❑ Pb Air ____ (QTY)
- ❑ Pb Soil/Solid ____ (QTY)
- ❑ Pb TCLP ____ (QTY)
- ❑ Drinking Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY) ❑ As ____ (QTY)
- ❑ Waste Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY) ❑ As ____ (QTY)
- ❑ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
- ❑ Spore-Trap ____ (QTY)
- ❑ Surface Vacuum Dust ____ (QTY)
- ❑ Surface Swab ____ (QTY)
- ❑ Culturable ID Genus (Media ____) ____ (QTY)
- ❑ Surface Tape ____ (QTY)
- ❑ Culturable ID Species (Media ____) ____ (QTY)
- ❑ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION					ANALYSIS							MATRIX						CLIENT CONTACT (LABORATORY STAFF ONLY)		
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WIPES AND OTHER	SPORE TRAP	TAPE	SWAB	Date/Time:	Contact:	By:
LEO-ASB-01		7/26/16					X				X								
																	Date/Time:	Contact:	By:
																	Date/Time:	Contact:	By:

LABORATORY STAIN ONLY (CUSTODY)
1. Date/Time RCVD: 7/26/16 @ ____ Via: ____
2. Date/Time Analyze[redacted] T AVAILA[redacted]
3. Results Reported T[redacted]
4. Comments: ____

Non-Responsive

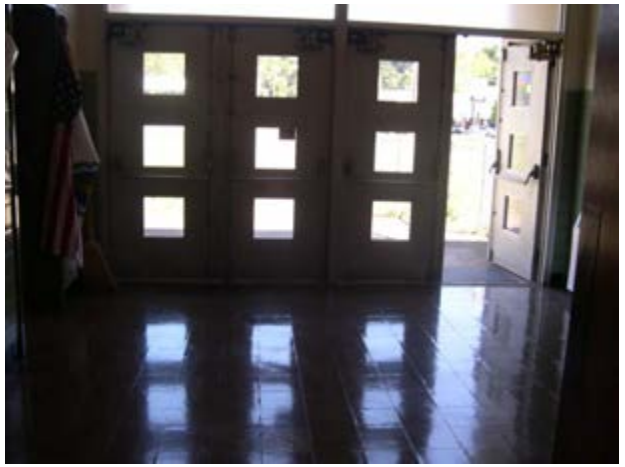
Appendix C
Photo Documentation

Leominster RC

Drill Hall

Storage Area

Damaged TSI



Front Entry

Leominster RC

Mess Hall

Kitchen

Boiler

Flammable Cabinet

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Leominster**	IAQ							Light		
Date	7/26/2010	Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017					Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08					Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Values (fc)
1	Office	0	08:53 AM	75.0		43.7		533		0.6		34.7	X	50
2	Office	1	08:53 AM	75.5		44.8		534		0.4		2.7	X	50
3	Office	0	08:54 AM	76.1		56.6		444		0.3		8.7	X	50
4	Office	0	09:00 AM	78.4		51.7		478		0.8		19.9	X	50
5	Hall	0	09:01 AM	78.5		49.8		392		0.5		56.2		5
6	Office	0	09:03 AM	78.3		48.4		354		0.3		82.3		50
7	Entry Way	0	09:05 AM	77.8		47.7		402		0.5		27.3		10
8	Armorer Office	0	09:06 AM	77.5		47.6		358		0.3		17.3	X	50
9	Mess Hall	0	09:08 AM	79.2		48.3		359		0.2		57.0		10
10	Kitchen	0	09:10 AM	80.7	X	46.6	X	385		0.3		89.6		50
11	Women's Locker	0	09:15 AM	81.3	X	44.2	X	556		0.1		63.3		7
11	Women's Restroom	0	09:16 AM	81.4	X	42.5	X	397		0.4		11.1		5
12	Men's Restroom	0	09:19 AM	81.6	X	46.3	X	395		0.2		14.8		5
12	Men's Locker	0	09:20 AM	81.9	X	45.6	X	392		0.2		88.6		7
13	Storage	0	09:23 AM	81.8	X	45.7	X	423		0.2		33.7		5-30
14	Office	0	09:26 AM	82.3	X	45.0	X	503		0.2		69.7		50
15	Office	0	09:28 AM	82.1	X	41.7	X	366		0.4		42.6	X	50
16	Mechanical Room	0	09:31 AM	81.9	X	42.6	X	394		0.2		51.9		30

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°F
40%	68.5°F-75.5°F	73.5°F-79.5°F
50%	68.5°F-74.5°F	73.0°F-79.0°F
60%	68.0°F-74.0°F	72.5°F-78.0°F

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Leominster**	IAQ							Light		
Date	7/26/2010	Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017					Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08					Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Values (fc)
17	Storage	0	09:39 AM	79.6	X	45.3	X	345		0.4		41.7		5-30
18	Drill Hall	0	09:42 AM	78.8	X	44.0	X	338		0.3		49.2		30-50

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°F
40%	68.5°F-75.5°F	73.5°F-79.5°F
50%	68.5°F-74.5°F	73.0°F-79.0°F
60%	68.0°F-74.0°F	72.5°F-78.0°F

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
21 OAK STREET
LEOMINSTER, MA 01453

July 12, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

BEST AVAILABLE COPY

TABLE OF CONTENTS

Section **Page**

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
21 OAK ST., LEOMINSTER, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	Increase lighting in the work areas. While work is in progress, these areas must be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04).	RAC 4
Ergonomics		
Computer workstations in the Administrative Areas were observed with un-adjustable chairs, arm rests and keyboards. Several wheeled chairs with four casters were noted.	Ergonomic issues with regard to the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3).	RAC 3
Water Intrusion		
Facility personnel noted leaks in the Drill Hall ceiling, above the men's latrine.	The source of the water intrusion should be identified and repaired. (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Lead		
Three of the 10 lead wipe samples indicated elevated lead levels.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is required.	Conduct a hazard assessment of site operations to determine what types of PPE are required for each type of work (29 CFR 1910.132(d)(1)).	RAC 4

Findings	Recommendations	Risk Assessment Code (RAC)
Housekeeping		
Storage areas were found to be somewhat unorganized at the time of URS' site visit.	All places of employment, passageways, storerooms and service rooms shall be kept clean and orderly and in a sanitary condition (29 CFR 1910.22 (a)(1))	RAC 3
Chemical Storage		
Chemicals/ flammable materials were observed improperly stored.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 3
Ladders		
Ladders were observed that were not properly stored in a vertical position fastened to walls.	Ladders not in use must be properly stored in a vertical position fastened to walls (29 CFR 1910.25 (c)(2)(i)).	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center in Leominster, Massachusetts.

URS representative, Mr. Non-Responsive, conducted the Industrial Hygiene Survey on April 29, 2013. The scope of work included an overall assessment of the facility as it relates to industrial hygiene and included a walkthrough of the facility, collection of photographs, and when required, measurements for illumination (light), area and personal air sampling, and noise mapping.

The Leominster Readiness Center is a one-story brick building, consisting of offices, classrooms, a supply area, a mess hall, gender separate bathrooms, locker storage rooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Walkways in storage areas were cluttered at the time of this survey. Chemicals/ flammable materials were observed not properly stored. Ladders were observed not properly stored.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Three of ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

ASBESTOS: Presumed asbestos-containing floor tiles and associated mastic were identified during this survey, however no Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined

not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. Computer workstations were assessed during the walkthrough for ergonomic issues. The computer workstations in the facility did not meet the current Occupational Safety and Health Administration (OSHA) ergonomic recommendations. The chair armrests, keyboards, and desks were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker. Wheeled chairs with only four casters were identified throughout the admin areas.

NOISE: Area noise monitoring levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, gender separate bathrooms, storage rooms, a mess hall, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be somewhat cluttered and unorganized at the time of URS' site visit.

2.2 Chemical and Physical Agents Sampled

2.2.1 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made in the Readiness Center. Interior carbon dioxide concentrations were found to be between 515 and 760 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is human respiration. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems but is typically used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

To minimize air quality complaints, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed that the carbon dioxide concentration within an occupied workspace be maintained below 700 ppm above ambient outside levels. For example, on the day of the survey, the outside carbon dioxide level was measured at 434 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1,134 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Readiness Center was measured between 0.0 ppm and 0.2 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Trak Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 33.96%, which was within the guideline of less than 65% recommended by ASHRAE.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

The average temperature inside the Readiness Center was, 69.2 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot candles (FC) and the recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Maintenance/ Distribution Platoon, table	Admin	62.7	50
Cafeteria, counter	Break Room	**42.3**	50
Classroom, table	Admin	**39.4**	50
Kitchen, counter	Break Room	92.8	50
Weight Room, bench	Break Room	34.9	30
Supply Office, desk	Admin	62.4	50
Storage, former indoor firing range, hallway	Admin	59.2	5
Recruiter Office, workstation	Admin	82.1	50
1st Sergeant's Office, workstation	Admin	70.9	50
Commander's Office, workstation	Admin	73.3	50
NCO/ HQ Office, left window workstation	Admin	**48.5**	50
NCO/ HQ Office, right window workstation	Admin	**49.4**	50

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in three of the office/administrative locations.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms /Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/Square Foot ($\mu g/ft^2$)
NCO/ HQ Office, floor by copy machine	Leominster RC Wipe-01	0.108	<110	200
Maintenance/ Distribution Platoon Office, window sill	Leominster RC Wipe-02	0.108	**210**	200
Classroom/ Cafeteria, top of heater, under window	Leominster RC Wipe-03	0.108	120	200
1st Sergeant's Office, black metal shelf	Leominster RC Wipe-04	0.108	<110	200
Supply Room, storage shelves	Leominster RC Wipe-05	0.108	<110	200
Drill Hall, top of lockers	Leominster RC Wipe-06	0.108	**290**	200
Boiler Room, top of electrical box	Leominster RC Wipe-07	0.108	**1200**	200
Platoon Storage (former Indoor Firing Range), floor, middle of hallway	Leominster RC Wipe-08	0.108	190	200
Kitchen, top of stove shelf	Leominster RC Wipe-09	0.108	<110	200
Gym, floor under multi-purpose weight machine	Leominster RC Wipe-10	0.108	<110	200

Three of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

No peeling paint was observed and therefore no paint chip samples were collected for analysis.

2.2.7 Asbestos

No damaged, friable suspect material was identified during this survey for sample collection.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Area noise dosimetry was conducted within the administrative office area. Area exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-3 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-3
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Office- RCO/ HQ	Administrative	364	55.5	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included hard hats, safety glasses, ear plugs and nitrile gloves. At the time of URS' site visit, no personal protective equipment was observed in use.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility.

3.2 Hearing Conservation

A written hearing conservation program was identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

Ladders were observed not properly stored in the boiler room. Floor tiles were noted to be pulling up in the first floor main entrance. Cleaning products were improperly stored in the boiler room. Many out of service fire extinguishers were improperly stored in the platoon storage area hallway. Wheeled chairs with only four casters were identified throughout the admin areas.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program, 15 August 2003

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

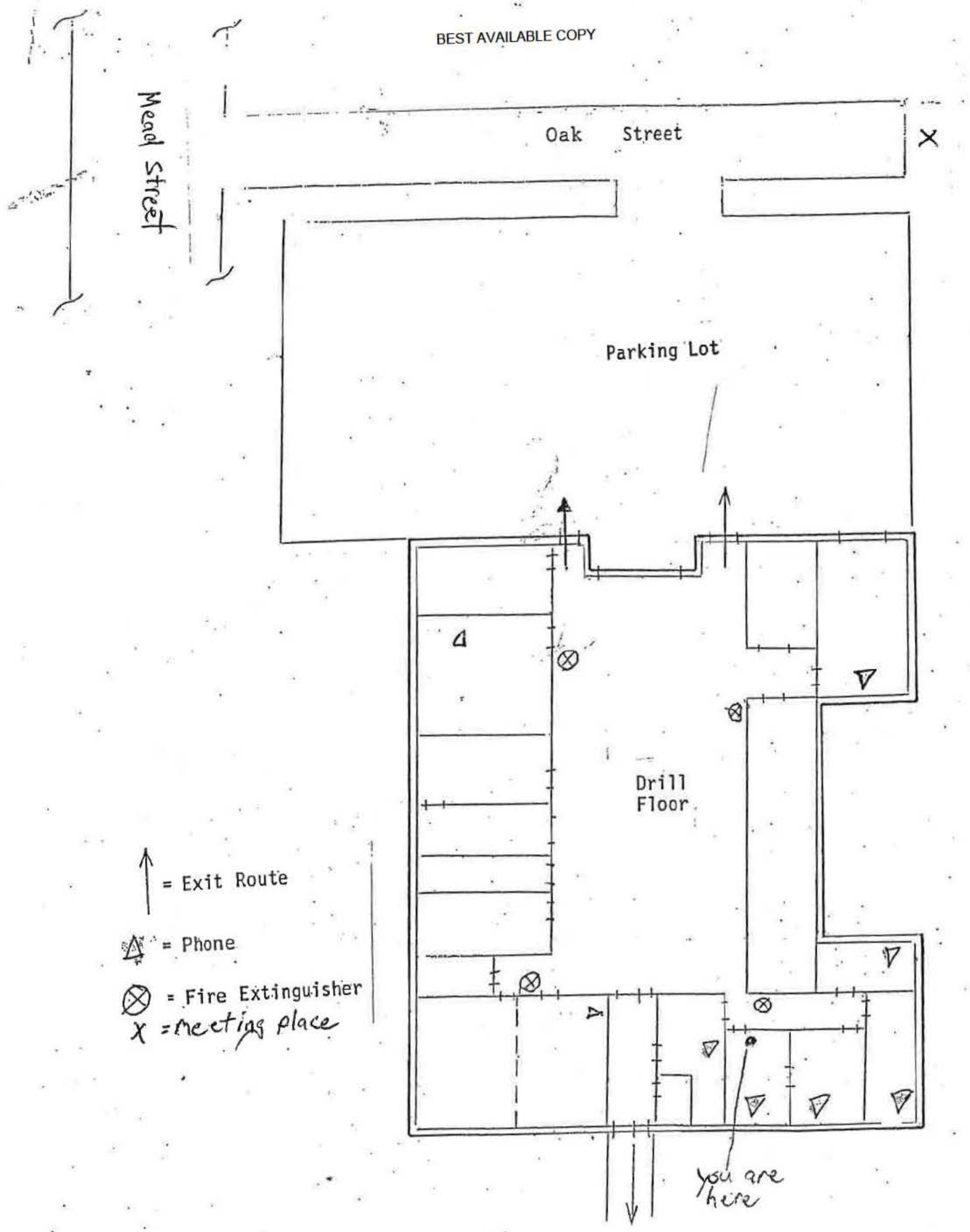
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING



APPENDIX B

PERSONNEL LIST

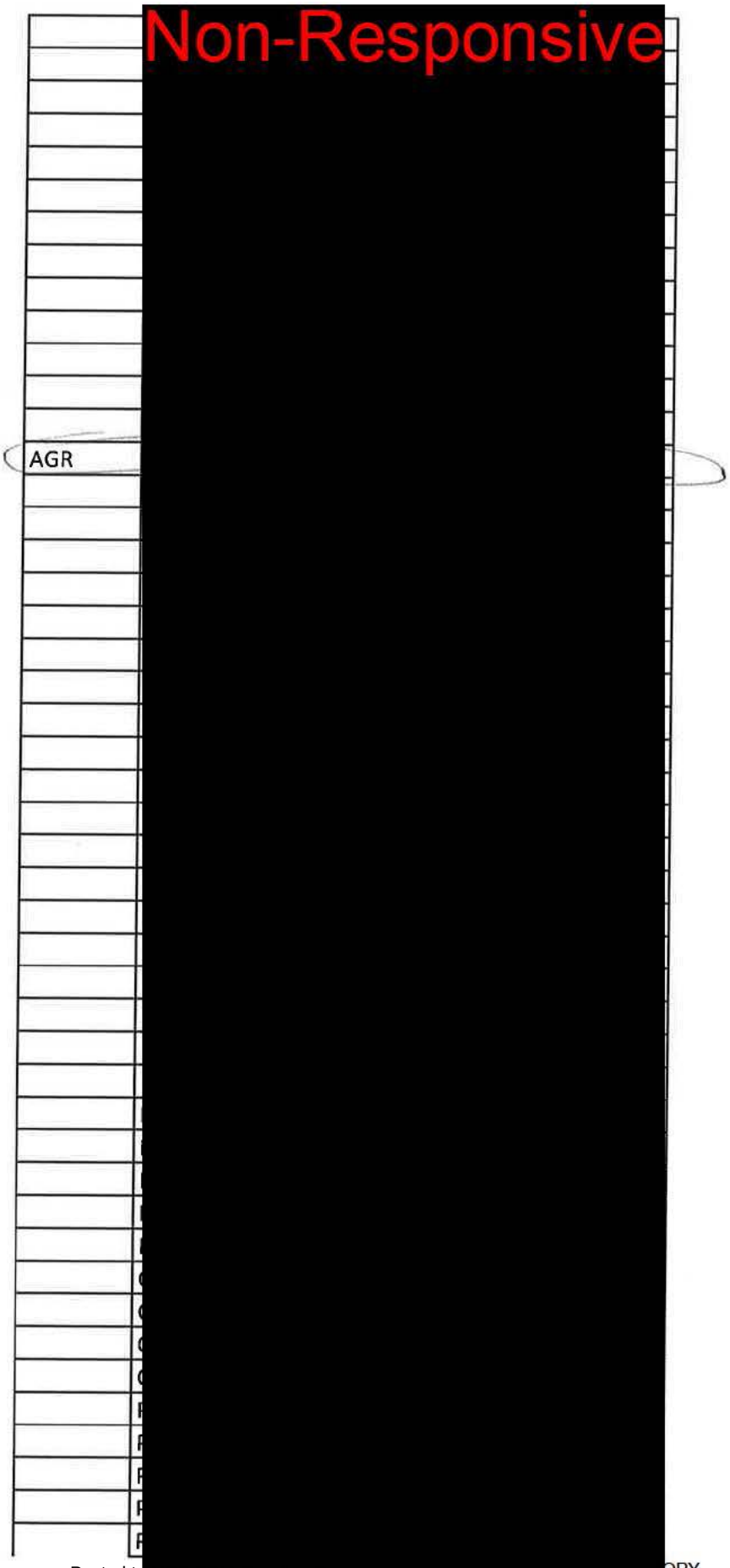
UNIT	LNAME	FNAME
	Non-Responsive	

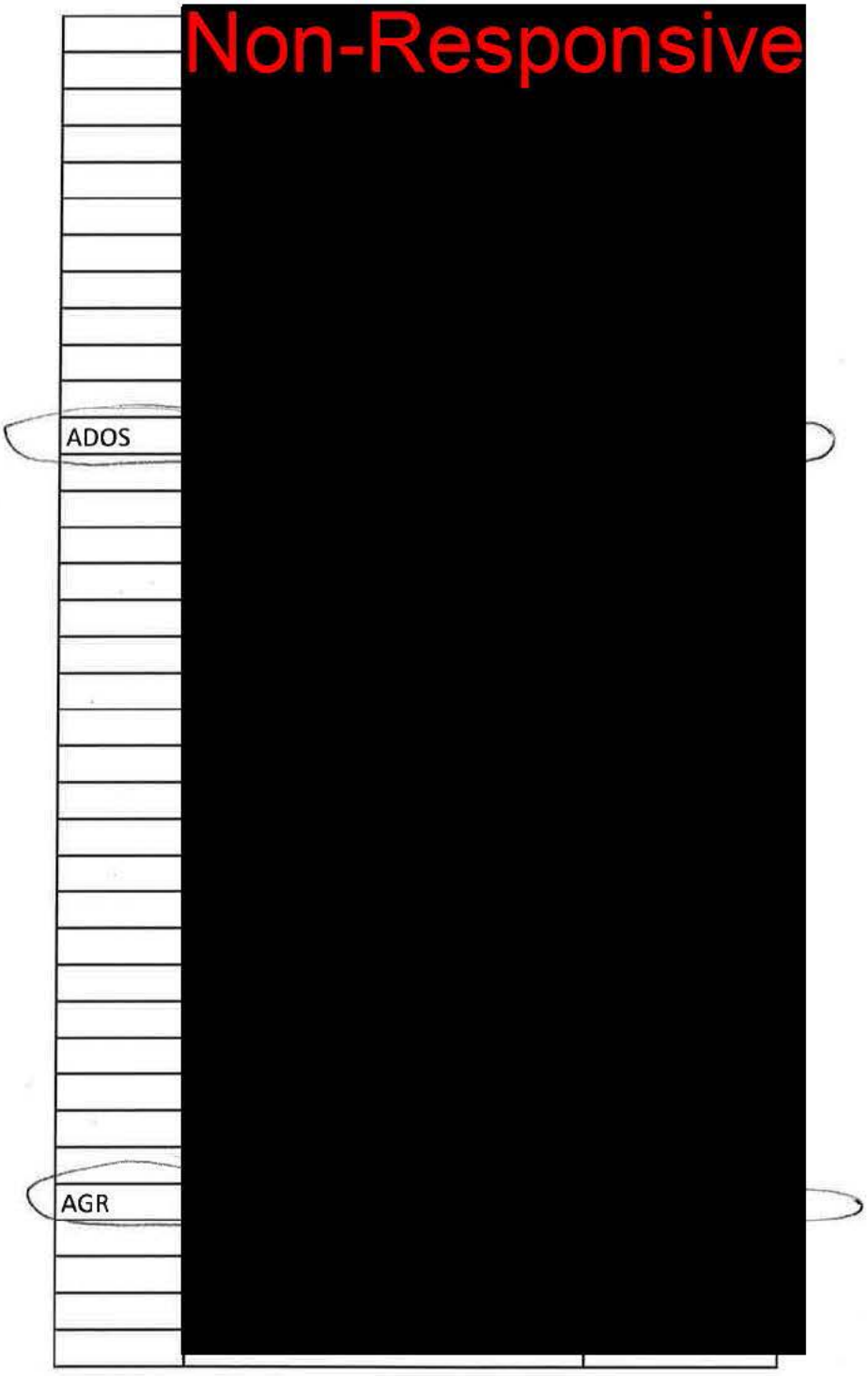
Enlisted

UNIT	LNAME	FNAME
	Non-Responsive	

Circled are full time Leominster RC

AGR




Non-Responsive
ADOS
AGR

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515815
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	21 Oak Street, Leominster, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Leominster RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13059845	LeominsterRC Wipe 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13059846	LeominsterRC Wipe 02	Flame	Wipe	****	0.108	110	ug/ft²	22	210	ug/ft²	
13059847	LeominsterRC Wipe 03	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13059848	LeominsterRC Wipe 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13059849	LeominsterRC Wipe 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13059850	LeominsterRC Wipe 06	Flame	Wipe	****	0.108	110	ug/ft²	32	290	ug/ft²	
13059851	LeominsterRC Wipe 07	Flame	Wipe	****	0.108	110	ug/ft²	130	1200	ug/ft²	
13059852	LeominsterRC Wipe 08	Flame	Wipe	****	0.108	110	ug/ft²	20	190	ug/ft²	
13059853	LeominsterRC Wipe 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13059854	LeominsterRC Wipe 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13059855	LeominsterRC Wipe FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515815
Address:	301-III Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	21 Oak Street, Leominster, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Leominster RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.
Air and Wipe results are not corrected for any blank results
Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

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OWI (410) 247-2024

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 515815

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA ARNG
2. Job Location: 21 Oak st, Leominster, MA
3. Job #: [redacted]
4. Contact Pers[redacted]
5. Submitted b[redacted]

Reporting Information (Results will be provide[redacted] **):** phone: [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS		REP
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☐ Next Day ☐ 2 Day	☐ 3 Day ☒ 5 Day + Date Due: 5/13/13 ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Incl[redacted]ith Report ☒ [redacted] urs.com ☐ Fax [redacted] us.army.mil ☐ Ver[redacted] us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ____ (QTY)
- ☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ____ (QTY)
- ☐ NIOSH 7402 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate ____ (QTY)
- ☐ EPA Point Count ____ (QTY)
- ☐ NY State Friable 198.1 ____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield ____ (QTY)
- ☐ NY State PLM/TEM ____ (QTY)
- ☐ Residual Ash ____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
- ☐ Quan. (s/area) Dust D6480-99 ____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ____ (QTY)
- ☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- ☐ Pb Paint Chip ____ (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 11 (QTY)
- ☐ Pb Air ____ (QTY)
- ☐ Pb Soil/Solid ____ (QTY)
- ☐ Pb TCLP ____ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
- ☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
- ☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
- ☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
- ☐ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER/AIR/OTHER	SPORE TRAP	TAPE	SWAB
Leominster RC wipe 01	Admin	4/29/13		1ft²				X				X				
Leominster RC wipe 02	↓	↓		↓				X				X				
Leominster RC wipe 03								X				X				
Leominster RC wipe 04								X				X				
Leominster RC wipe 05	↓							X				X				
Leominster RC wipe 06	Maintenance							X				X				
Leominster RC wipe 07								X				X				
Leominster RC wipe 08								X				X				
Leominster RC wipe 09								X				X				
Leominster RC wipe 10	↓							X				X				
Leominster RC wipe FB	Field Blank	↓		↓				X				X				

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 5 10 13 @ ____ Via: Fedex By (Print): [redacted]
2. Date/Time Analyzed: __/__/__ @ ____ By (Print): ____
3. Results Reported To: ____ Date: __/__/__ Initials:
4. Comments: 7940 6954 8931

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APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Leominster RC	21 Oak St., Leominster, MA	39743799

Photo No.	Date:
1	4/29/13

Description:

Presumed asbestos-containing floor tiles at main entrance, with no entry mat.

Photo No.	Date:
2	4/29/13

Description:

Platoon Storage area, somewhat cluttered at the time of the survey.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Leominster RC	21 Oak St., Leominster, MA	39743799

Photo No.	Date:
3	4/29/13

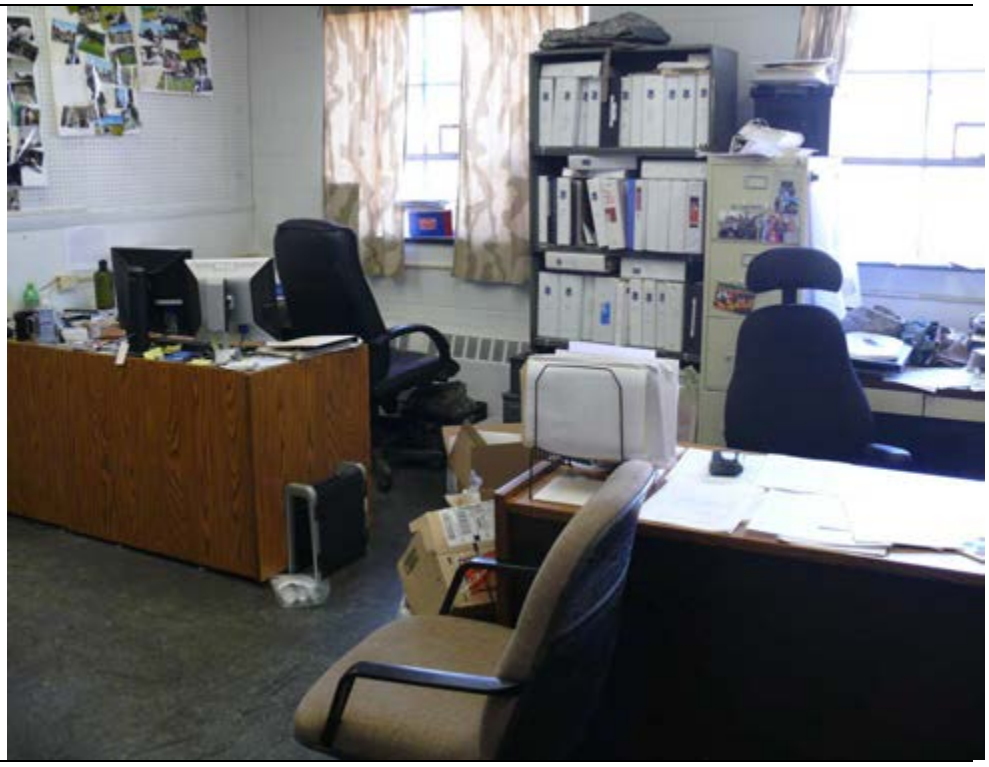
Description:

Improperly stored ladders in Storage Area.

Photo No.	Date:
4	4/29/13

Description:

Typical office ergonomics. Work areas were cluttered at the time of the survey.



APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
LEXINGTON READINESS CENTER
459 BEDFORD STREET
LEXINGTON, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS (Continued)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in approximately half the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Peeling lead-based paint was present on the floor in office # 37.	Personnel trained in accordance with the OSHA Lead Standard should stabilize and cover the peeling lead paint (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Lead was detected in wipe samples collected from the former firing range in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Damaged and missing floor tile was present throughout the facility. Exposed pipefittings and tank insulation were found in various locations.	Repair or remove asbestos-containing floor tile, pipefittings and tank insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was available.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Fire Safety		
An obstructed fire extinguisher was found in the basement area.	Fire extinguishers must be made available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher (OSHA 29 CFR 1910.156(b)(6)).	RAC 2

FINDINGS AND RECOMMENDATIONS (Continued)

Findings	Recommendation	Risk Assessment Code
Mold		
Watermarks were observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 459 Bedford Street in Lexington, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On January 28, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Lexington, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chair armrests were in a fixed position and keyboards could not be adjusted in offices #11 (Photo # 3367) and #5 (Photo # 3371). Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using a work station, then proper adjustments need to be made to accommodate each person. No complaints concerning ergonomics were made by site personnel during the visit.

Water marks were observed on the ceiling in office # 34 (Photo # 3373), hallway # 8 (Photo # 3370) and locker room # 54 (Photos # 3363-64).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 15.0% to 17.2% with an average of 16.2% on the 1st floor. The basement ranged from 16.1% to 20.5% with an average of 16.8%. These readings were below the recommended range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations on the 1st floor ranged from 359 to 539 parts per million (ppm), with an average of 370 ppm. The

basement ranged from 366 to 418 parts per million (ppm), with an average of 379 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Given an average background level of 400 ppm on the day of the survey, the ASHRAE limit would be 1100 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. The carbon monoxide concentration remained at 0 parts per million (ppm) throughout the survey period. The measured level was below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting – Table B-1).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (Lux)	Recommended Minimum Illuminance (Lux)
Office # 2	Administrative Duties	1463	500
Office # 3	Administrative Duties	445	500
Office # 5	Administrative Duties	724	500
Office # 9	Administrative Duties	380	500
Office # 11	Administrative Duties	899	500
Office # 13	Administrative Duties	1572	500
Office # 14	Administrative Duties	488	500
Office # 15	Administrative Duties	430	500
Office # 17	Administrative Duties	461	500
Office # 31	Administrative Duties	690	500
Office # 52	Administrative Duties	605	500
Front Lobby # 18	Accessway	336	30
Hallway # 8	Accessway	127	30
Hallway # 25	Accessway	175	30
Hallway # 61	Accessway	224	30

On the day of the survey the illuminance in the administrative area was inadequate in approximately half of the offices.

2.2.5 Lead

Paint chips were collected in four areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. Sample # 0128-LPC01 was found to contain lead in a concentration that exceeds the U.S. Housing and Urban Development

(HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels Of Lead In Paint Found In The Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Office #37 – Floor	0128-LPC01	0.01	2.2
Office #38 – Floor	0128-LPC02	0.01	<0.0091
Basement Area # 62	0128-LPC03	0.01	0.11
Hallway # 61	0128-LPC04	0.01	0.03

The analytical report from AMA is contained in Appendix D.

URS collected lead wipe samples in this area, in accordance with the Army National Guard statement of work. Sample results will be provided in a supplemental letter.

2.2.6 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-3 below presents the results of the sample analysis.

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized

Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-3 below presents the results of the sample analysis.

Table 2-3
Sample Results of Suspect ACM in the Administrative Area

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Office #38	Gypsum Board	0128-AB01A	NAD
Office #38	Gypsum Board	0128-AB01B	NAD
Office #38	Gypsum Board	0128-AB01C	NAD
Phone Room # 40	Pipefitting Insulation	0128-AB02A	10
Phone Room # 40	Pipefitting Insulation	0128-AB02B	10
Office # 45	Cream/Rust Linoleum	0128-AB03A	NAD
Office # 47	Cream/Rust Linoleum	0128-AB03B	NAD
Office # 49	Cream/Rust Linoleum	0128-AB03C	NAD
Hallway # 8	9"x9" Black Floor Tile	0128-AB05A-FT	3
Hallway # 8	9"x9" Black Floor Tile	0128-AB05B-FT	3
Hallway # 8	9"x9" Black Floor Tile	0128-AB05C-FT	3
Hallway # 8	9"x9" Black Floor Tile Mastic	0128-AB05A-M	NAD
Hallway # 8	9"x9" Black Floor Tile Mastic	0128-AB05B-M	TR
Hallway # 8	9"x9" Black Floor Tile Mastic	0128-AB05C-M	TR
Kitchen # 6	9"x9" White Floor Tile	0128-AB06A-FT	TR
Kitchen # 6	9"x9" White Floor Tile	0128-AB06B-FT	2
Kitchen # 6	9"x9" White Floor Tile	0128-AB06C-FT	2
Kitchen # 6	9"x9" White Floor Tile Mastic	0128-AB06A-M	NAD
Kitchen # 6	9"x9" White Floor Tile Mastic	0128-AB06B-M	NAD
Kitchen # 6	9"x9" White Floor Tile Mastic	0128-AB06C-M	NAD

NAD = "No Asbestos Detected"

TR = "Trace Amount of Asbestos" (Less than 1%)

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. There was an obstructed fire extinguisher in basement area # 50 (Photo # 3362).

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors should be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in approximately half of the offices. URS recommends increasing lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: URS observed four areas with peeling paint. Paint chips were collected from these areas and it was determined that the floor in Office #37 contains lead-based paint. URS recommends that this area be covered since the paint is likely to continue peeling. The three other areas with peeling paint should be stabilized to prevent further peeling.

ASBESTOS: Damaged floor tile in hallway #8 (Photo # 3368) and kitchen #6 (Photo # 3369) were determined to contain asbestos in a concentration greater than one percent. It is recommended that the damaged tile be replaced with new, non-asbestos tile by an

appropriately trained technician. Some damaged pipe insulation ends were found in phone room # 40 (Photo # 3360) which should also be repaired.

MOLD: The water stains on the ceilings could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Firing Range-Top of Light Guard	0128-LW06	0.500	60,000	200
Firing Range-Top of a Cabinet	0128-LW07	1.000	120	200
Firing Range-Floor-Rear	0128-LW08	1.000	470	200
Firing Range-Floor-Center	0128-LW09	1.000	66	200
Firing Range-Floor-Front	0128-LW10	1.000	150	200
Blank	0128-LWBlank1	N/A	<12	n/A

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0128-LA02	1104	<2.7	50.0
Blank	0128-LA03	N/A	<3.0 µg	N/A

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Two surfaces within the former firing range were found to contain lead dust levels which exceed the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office. URS recommends that an appropriately licensed lead contractor clean the former firing range. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleanup and rehabilitation of indoor firing ranges is contained in Appendix H.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,200 square foot area with about a 30-foot high ceiling used for assembling personnel and storing equipment. The walls are constructed of cinder blocks with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall # 35-Floor	0128-LW01	1.000	13	200
Drill Hall # 35-Floor	0128-LW02	1.000	<12	200
Drill Hall # 35-Top of Snack Machine	0128-LW03	1.000	<12	200
Drill Hall # 35-Top of a Locker	0128-LW04	1.000	130	200
Drill Hall # 35-Top of a Refrigerator	0128-LW05	1.000	18	200
Blank	0128-LWBlank1	N/A	<12	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Levels of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0128-LA01	1108	<2.7	50.0
Blank	0128-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected in the drill hall for lead were found to be within allowable limits and require no further action at this time. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

2.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 5-1 below presents the results of the sample analysis.

Table 5-1
Samples Results of Suspect ACM in the Boiler Room

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room # 60	Pipefitting Insulation	0128-AB02C	15
Boiler Room # 60	Tank Insulation	0128-AB04A	40
Boiler Room # 60	Tank Insulation	0128-AB04B	30
Boiler Room # 60	Tank Insulation	0128-AB04C	40

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr Non-Responsive asbestos inspector training certificate is provided in Appendix E.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

ASBESTOS: The asbestos pipe insulation was observed to have damaged fittings. The old hot water heater insulation wrap had some exposed sections (Photo # 3366). Both materials should be repaired.

MOLD: There were water stains on the pipe run insulation with visible mold growth (Photo # 3365) that should be addressed before they become a larger problem.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A written program was found in the Safety Book under tab U but was not specific to the site. No training records were found on site.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

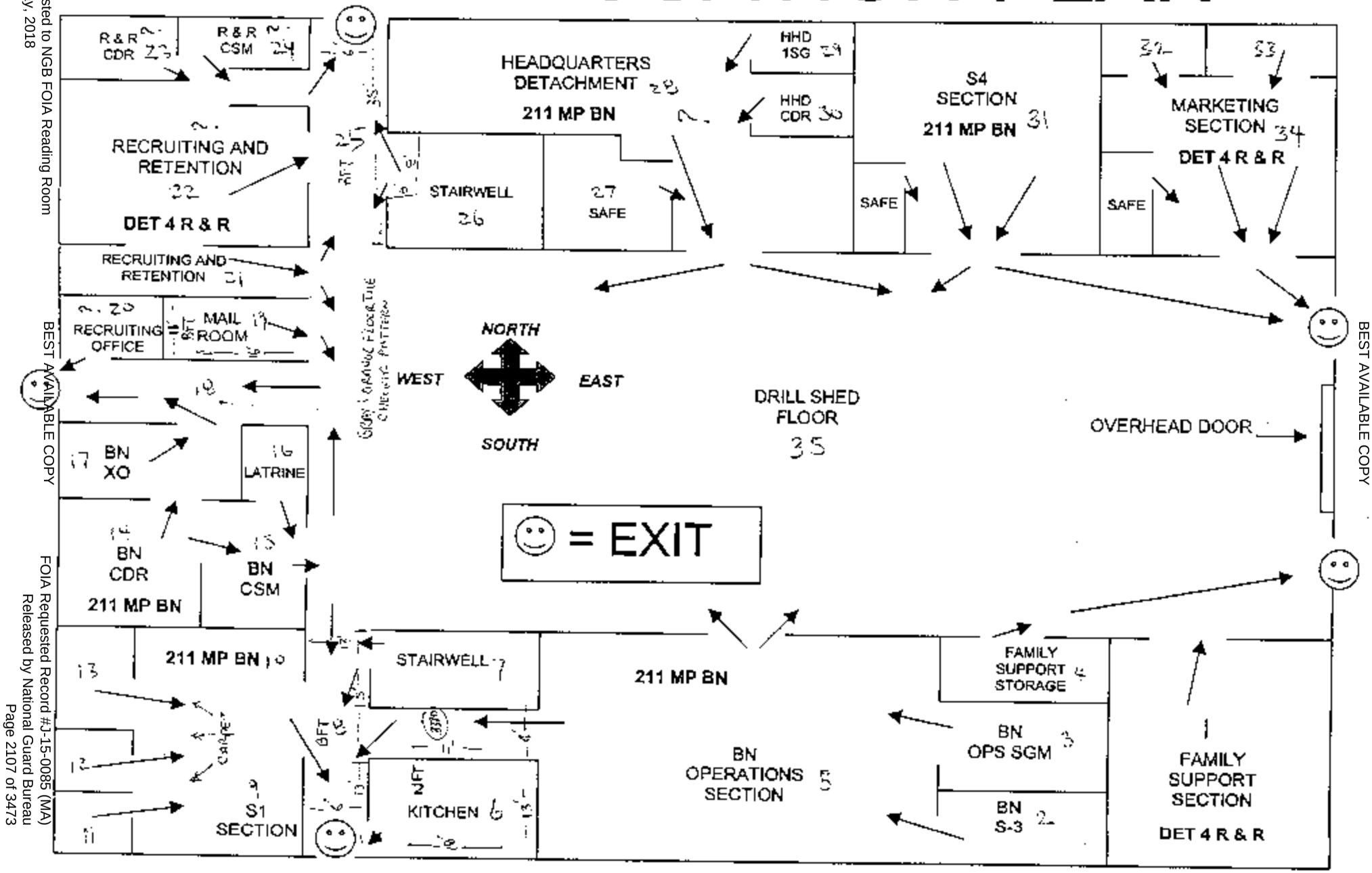
Standard for General Industry: 29 CFR 1910

APPENDIX A

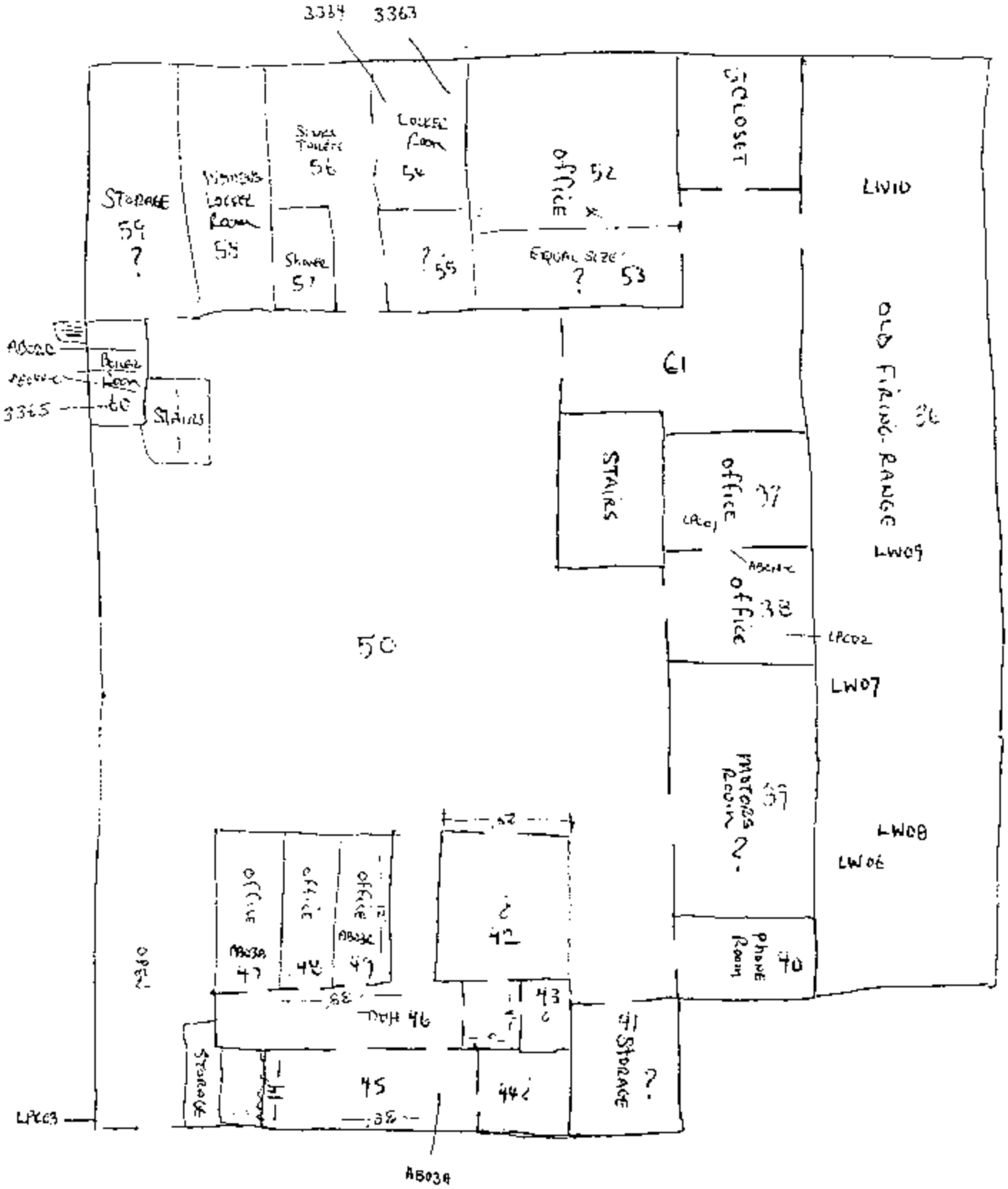
SHOP DRAWING

LEXINGTON

FIRE EVACUATION PLAN



First Floor



BASEMENT

APPENDIX B

PERSONNEL LIST

Lexington FTUS personnel 211th MP BN, & 65th Press Camp HQs

Non-Responsive

Administrative Officer
Training Officer
BN Operations Sergeant
BN Personnel Sergeant
Personnel Sergeant
BN Supply Sergeant
65th Press Camp Readiness NCO
211th HHD Readiness NCO
211th HHD Supply Sergeant
Civilian armorer
Recruiting command
Recruiting command

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client: National Guard Bureau
Address: 301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation
Havre de Grace, Maryland 21078

Job Name: Army National Guard
Job Location: 459 Bedford St. Lexington, MA
Job Number: Not Provided
P.O. Number: Not Provided

Chain Of Custody: 122700
Date Analyzed: 02/10/2004
Person Submitting: [redacted]
Report Date: 18-Feb-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0423001	0128 LA 01	Flame	Air	1108	N/A	2.71	ug/m³	<	2.7	ug/m³	
0423002	0128 LA 02	Flame	Air	1104	N/A	2.72	ug/m³	<	2.7	ug/m³	
0423003	0128 LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	
0423004	0128 LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb		2.2	%Pb	
0423005	0128 LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	<	0.0091	%Pb	
0423006	0128 LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb		0.11	%Pb	
0423007	0128 LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb		0.03	%Pb	
0423008	0128 LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²		13	ug/ft²	
0423009	0128 LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²	<	12	ug/ft²	
0423010	0128 LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²	<	12	ug/ft²	
0423011	0128 LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²		130	ug/ft²	
0423012	0128 LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²		18	ug/ft²	
0423013	0128 LW 06	Flame	Wipe	****	0.500	24.00	ug/ft²		60000	ug/ft²	
0423014	0128 LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²		120	ug/ft²	
0423015	0128 LW 08	Flame	Wipe	****	1.000	12.00	ug/ft²		470	ug/ft²	
0423016	0128 LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²		66	ug/ft²	
0423017	0128 LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²		150	ug/ft²	
0423018	0128 LW BLANK 1	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122700
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	459 Bedford St. Lexington, MA	**Date Analyzed:**	02/10/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	18-Feb-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted]nical Manager: [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples.

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122700
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	459 Bedford St. Lexington, MA	**Date Analyzed:**	2/10/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0423019	0128 AB 01 A	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	CK	
0423020	0128 AB 01 B	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	CK	
0423021	0128 AB 01 C	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	CK	
0423022	0128 AB 02 A	10	--	10	--	--	--	--	--	--	--	90	Gray	CK	
0423023	0128 AB 02 B	10	--	10	--	--	--	--	--	--	--	90	Gray	CK	
0423024	0128 AB 02 C	15	--	15	--	--	--	--	--	--	--	85	Gray	CK	
0423025	0128 AB 03 A	NAD	--	--	--	--	--	--	20	--	--	80	Beige	CK	
0423026	0128 AB 03 B	NAD	--	--	--	--	--	--	20	--	--	80	Beige	CK	
0423027	0128 AB 03 C	NAD	--	--	--	--	--	--	20	--	--	80	Beige	CK	
0423028	0128 AB 04 A	40	40	--	--	--	--	--	--	--	--	60	Gray	CK	
0423029	0128 AB 04 B	30	27	3	--	--	--	--	--	--	--	70	Gray	CK	
0423030	0128 AB 04 C	40	40	--	--	--	--	--	--	--	--	60	Gray	CK	
0423031	0128 AB 05 A-FT	3	3	--	--	--	--	--	--	--	--	97	Black	CK	
0423032	0128 AB 05 B-FT	3	3	--	--	--	--	--	--	--	--	97	Black	CK	
0423033	0128 AB 05 C-FT	3	3	--	--	--	--	--	--	--	--	97	Black	CK	
0423034	0128 AB 05 A-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	CK	

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122700
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	459 Bedford St. Lexington, MA	**Date Analyzed:**	2/10/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0423035	0128 AB 05 B-M	TR	TR	--	--	--	--	--	TR	--	--	100	Black	CK	
0423036	0128 AB 05 C-M	TR	TR	--	--	--	--	--	TR	--	--	100	Black	CK	
0423037	0128 AB 06 A-FT	TR	TR	--	--	--	--	--	--	--	--	100	Beige	CK	
0423038	0128 AB 06 B-FT	2	2	--	--	--	--	--	--	--	--	98	Beige	CK	
0423039	0128 AB 06 C-FT	2	2	--	--	--	--	--	--	--	--	98	Beige	CK	
0423040	0128 AB 06 A-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	CK	
0423041	0128 AB 06 B-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	CK	
0423042	0128 AB 06 C-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	CK	

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Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122700
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	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

[redacted] Non-Responsive

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

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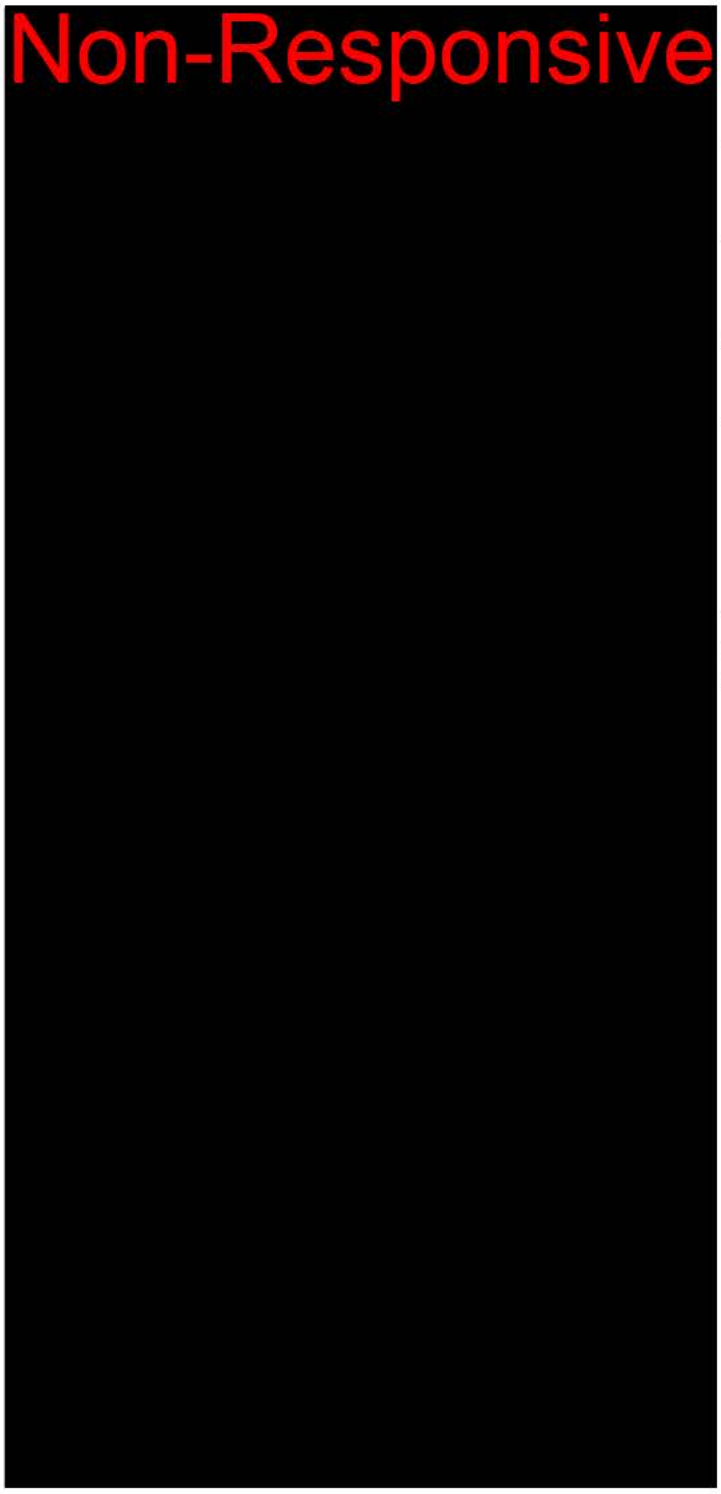
APPENDIX E

TRAINING CERTIFICATES



INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
Non-Responsive
President/Director of Training

APPENDIX F

PHOTOGRAPHS

Photo 3360: Phone Room – Damaged asbestos-containing pipe insulation

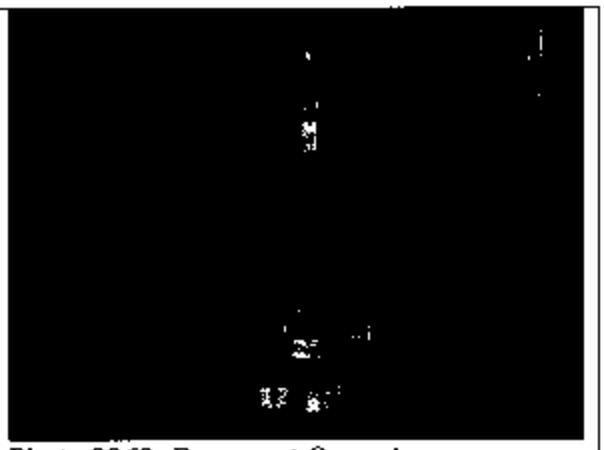


Photo 3362: Basement Open Area – Obstructed fire extinguisher

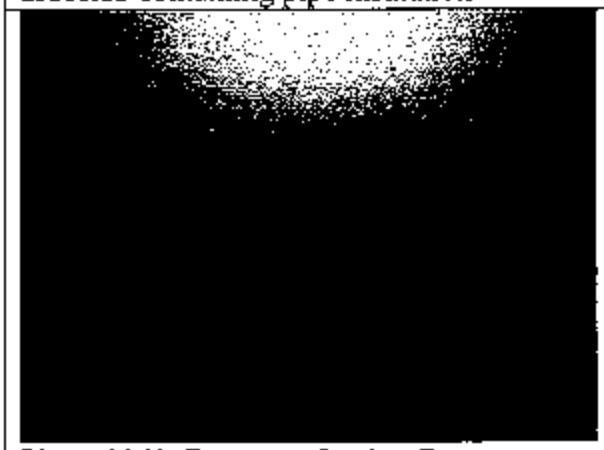


Photo 3363: Basement Locker Room – Water stained ceiling and mold growth

Photo 3364: Basement Locker Room Water stained ceiling and mold growth

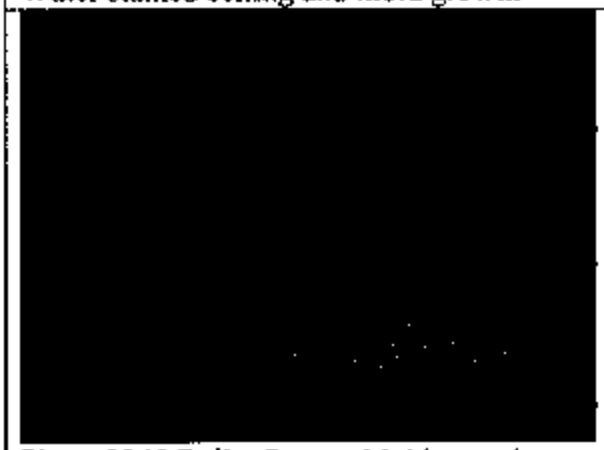


Photo 3365 Boiler Room- Mold growth on pipe insulation

Photo 3366: Boiler Room Damaged asbestos-containing tank insulation

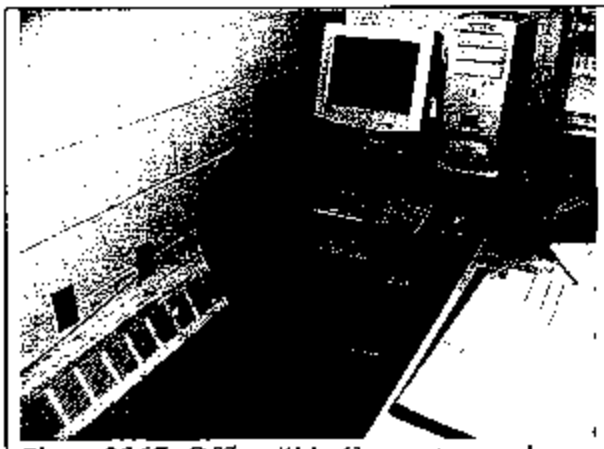


Photo 3367: Office #11: Computer work station

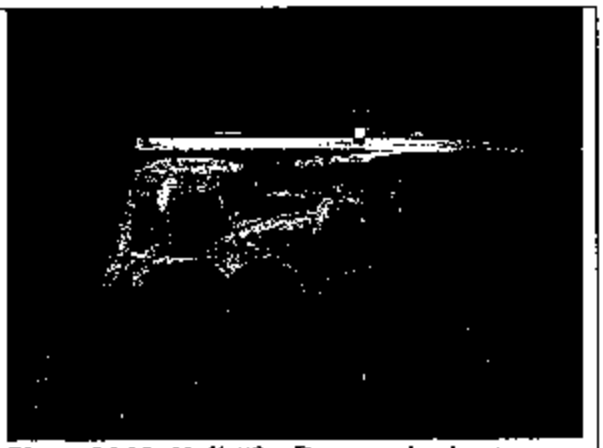


Photo 3368: Hall #8 - Damaged asbestos-containing floor tile

Photo 3369: Kitchen #6 - Damaged asbestos-containing floor tile

Photo 3370: Hall #8 Water stains on ceiling tiles

Photo 3371: BN OPS #5 - Poorly designed chair

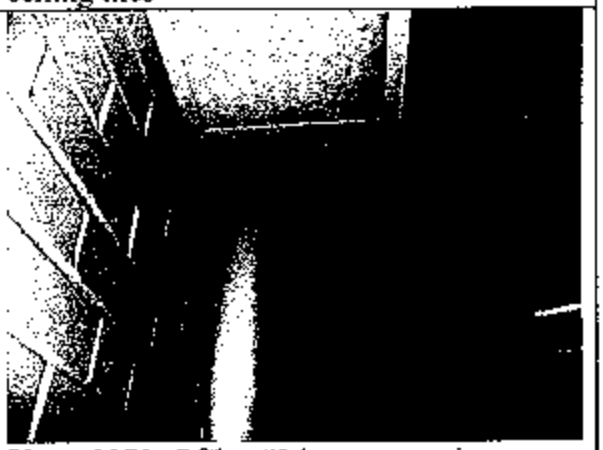


Photo 3373: Office #34 – water stains on ceiling tiles

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References

Related publications are listed below.

a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program)
b. AR 11-34 (The Army Respiratory Protection Program)
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges)

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes

[redacted]

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste

Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education

OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Establishod walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashby Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

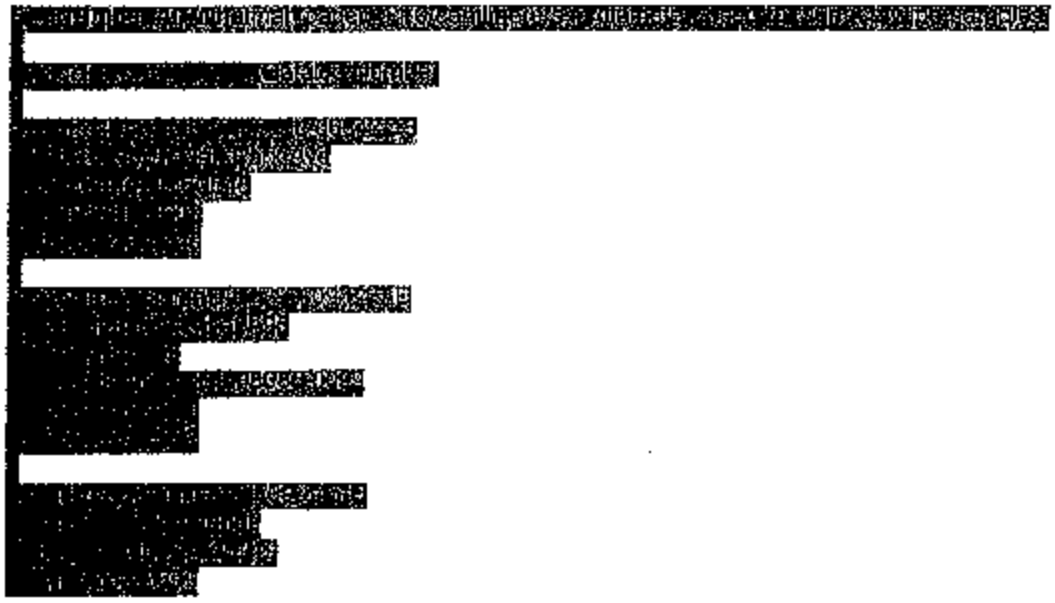
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75\ ug}{100\ cm^2} \quad \frac{929\ cm^2}{1\ sq\ ft}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 ug/sq\ ft$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address	Point of Contact *(name & phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	Date Collected	Date Shipped

Analysis Desired

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
459 BEDFORD STREET
LEXINGTON, MA 02421

June 25, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

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APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
459 BEDFORD ST., LEXINGTON, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	Increase lighting in the work areas. While work is in progress, these areas must be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04).	RAC 4
Ergonomics		
Computer workstations in the Administrative Areas were observed with un-adjustable chairs, arm rests and keyboards. Wheeled chairs with 4 casters were noted.	Ergonomic issues with regard to the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3).	RAC 3
Lead		
Two of the 10 lead wipe samples indicated elevated lead levels.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Emergency Exits		
Emergency exit signs and escape plans were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
Asbestos		
Asbestos-containing pipe insulation and presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available onsite.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is required	Conduct a hazard assessment of site operations to determine what types of PPE are required for each type of work (29 CFR 1910.132(d)(1)).	RAC 4

Findings	Recommendations	Risk Assessment Code (RAC)
Fire Extinguishers		
No evidence was found that all fire extinguishers were being inspected on a monthly basis.	All fire extinguishers must be inspected on a monthly basis to determine that they are full and readily accessible. (OSHA 29 CFR 1910.157(e)(2))	RAC 3
Extension Cords		
Extension cords were being used as permanent wiring and were taped across walkways.	Aisles and passageways shall be kept clear with no obstruction across or in the aisles that could create a hazard. (29 CFR 1910.22 (b)(1)).	RAC 3
Walking Surfaces		
Duct tape was used throughout the facility to secure tears in carpet and carpet at thresholds.	Flooring should be maintained in good repair to minimize uneven and slippery surfaces and tripping hazards (29 CFR 1910.22(b)(1)).	RAC 3
Hazard Communication		
Oil and chemicals were improperly stored in Medics Office.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 3

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center in Lexington, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on April 10, 2013. The scope of work included an overall assessment of the facility as it relates to industrial hygiene and included a walkthrough of the facility, collection of photographs, and when required, measurements for illumination (light), area and personal air sampling, and noise mapping.

The Lexington Readiness Center is a two-story brick building, consisting of offices, classrooms, a supply area, a classroom/mess hall, a conference room, gender separate bathrooms, storage rooms, locker storage areas, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: The basement former Indoor Firing Range was posted as unsafe due to lead contamination. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility. Duct tape was used throughout the facility to secure tears in carpet and carpet at thresholds. No evidence that all fire extinguishers were inspected monthly was found. Chemicals were improperly stored in the Medics Office. Passageways in the basement were blocked with materials. Extension cords were being used as permanent wiring and were observed stretched across walkways in the west conference room.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Two of the ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, none of the paint chip samples was found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: Asbestos-containing pipe insulation was identified during this survey, however no Asbestos Operations and Maintenance Program was found on site.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. Computer workstations were assessed during the walkthrough for ergonomic issues. The computer workstations in the facility did not meet the current Occupational Safety and Health Administration (OSHA) ergonomic recommendations. The chair armrests, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

Several wheeled chairs were observed with only four casters.

NOISE: Noise mapping in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, a classroom/mess hall, a conference room, gender separate bathrooms, storage rooms, locker storage areas, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be neat and organized at the time of URS' site visit.

2.2 Chemical and Physical Agents Sampled

2.2.1 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made in the Readiness Center. Interior carbon dioxide concentrations were found to be between 449 and 748 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is human respiration. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems but is typically used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

To minimize air quality complaints, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed that the carbon dioxide concentration within an occupied workspace be maintained below 700 ppm above ambient outside levels. For example, on the day of the survey, the outside carbon dioxide level was measured at 425 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below 1,125 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Readiness Center was measured between 0.0 ppm and 0.1 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Trak Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 36%, which was within the guideline of less than 65% recommended by ASHRAE.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

The average temperature inside the Readiness Center was, 73.8 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot candles (FC) and the

recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
1st Floor, Military Police Detachment Office, desk- Non-Responsive	Admin	52.8	50
1st Floor, Military Police Detachment Office, desk	Admin	78.5	50
1st Floor, Supply SSG. Office, desk- Non-Responsive	Admin	61.1	50
1 Floor, Medics, desk- Non-Responsive	Admin	58.9	50
1st Floor, Medics, desk- Non-Responsive	Admin	**48.0**	50
1st Floor, Medics, desk- Non-Responsive	Admin	**19.0**	50
1st Floor, Medics, vacant desk	Admin	90.6	50
1st Floor, Medics, side office	Admin	89.6	50
1st Floor, Recruiter's Office, desk- Non-Responsive	Admin	122.7	50
1st Floor, north hallway	Hall	41.1	10
1st Floor, Conference Room, table	Admin	60.3	50
1st Floor, Corner Office, desk- Non-Responsive	Admin	118.1	50
1st Floor, Corner Office, desk- Non-Responsive	Admin	65.6	50
1st Floor, Police Battalion Office, desk- Non-Responsive	Admin	109.4	50
1st Floor, Police Battalion Office, desk- Non-Responsive	Admin	77.6	50
1st Floor, Police Battalion Office, side/ corner desk	Admin	60.4	50
South Stairwell	Stairs	68.0	5
1st Floor, 211th MP Bn TOC Office, desk- Non-Responsive	Admin	76.3	50
1st Floor, 211th MP Bn TOC Office, side desk	Admin	124.7	50
1st Floor, 211th MP Bn TOC Office, desk towards Drill Hall	Admin	68.9	50
1st Floor, 211th MP Bn TOC Office, desk- Non-Responsive	Admin	64.2	50

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
1st Floor, Military Police Battalion S-4, desk- Non-Responsive	Admin	127.9	50
1st Floor, Front Offices off lobby, desk	Admin	67.2	50
1st Floor, Front Offices off lobby, desk- Non-Responsive	Admin	56.8	50
Basement, Storage/ Admin Room	Storage	31.4	30
Basement, Hallway	Hall	15.0	5

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in two of the locations surveyed.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Feet ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Feet ($\mu g/ft^2$)
Kitchen, floor, behind door	Lexington RC Wipe-01	0.108	<110	200
Medics, north perimeter, top of bookshelf	Lexington RC Wipe-02	0.108	<110	200
211th MP Bn TOC window sill, center of room	Lexington RC Wipe-03	0.108	<110	200
Military Police Battalion S-4, rear office, top of file cabinet	Lexington RC Wipe-04	0.108	<110	200
West Conference Room, center window sill	Lexington RC Wipe-05	0.108	**430**	200

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Feet ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Feet ($\mu g/ft^2$)
Former Indoor Firing Range, floor at doorway	Lexington RC Wipe-06	0.108	<110	200
Former Indoor Firing Range, stairwell to 1st floor	Lexington RC Wipe-07	0.108	120	200
Former Indoor Firing Range, hallway from Range to Supply Room, floor	Lexington RC Wipe-08	0.108	190	200
Side/ Rear Storage, floor towards rolling door, by MP Storage	Lexington RC Wipe-09	0.108	**540**	200
Drill Hall, floor behind soda machine	Lexington RC Wipe-10	0.108	<110	200

Two of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Three paint chip samples were collected from areas of peeling paint within the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Dull white paint, interior window sill	<0.0092	0.5
Green/ beige paint, wall, basement side storage by rolling door	0.096	0.5
Gray/ red paint, floor, at door to former Indoor Firing Range	0.026	0.5

On the day of the survey, none of the paint chip samples were found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

URS collected a total of three samples from damaged suspect friable asbestos-containing material (ACM) for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) recommended method for the determination of asbestos in bulk samples by polarized light microscopy with dispersion staining (EPA-600/M4-82-020). Table 2-4 below shows the results of the asbestos sampling.

Table 2-4
Asbestos Bulk Sample Results – Basement

Sample Location	Sample Description	URS Sample Number	Result Total Asbestos
South Stairwell, landing	Pipe Elbow Insulation	Lexington RC PLM-01A	10% Chrysotile
South Stairwell, landing	Pipe Elbow Insulation	Lexington RC PLM-01B	20% Chrysotile
South Stairwell, landing	Pipe Elbow Insulation	Lexington RC PLM-01C	10% Chrysotile

The EPA states that any material with an asbestos content greater than 1% must be treated as ACM (EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix C.

Presumed asbestos-containing floor tiles and associated mastic were also identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Noise mapping was conducted throughout the Readiness Center. Area noise mapping results indicated that, on the day of the survey, noise levels throughout the Readiness Center ranged from 50.2 decibels to 66.4 decibels. All noise mapping results were below the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included safety glasses, ear plugs and nitrile gloves.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not required for this site.

3.2 Hearing Conservation

A written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise mapping results, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was not identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center. No personal protective equipment was observed in use at the time of URS' site visit.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

The basement former Indoor Firing Range was posted as unsafe due to lead contamination. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility. Duct tape was used throughout the facility to secure tears in carpet and to seal carpet to thresholds. No evidence that all fire extinguishers were inspected monthly was found. Several wheeled chairs with only four casters were noted. Chemicals were improperly stored. Passageways were blocked with materials.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program, 15 August 2003

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

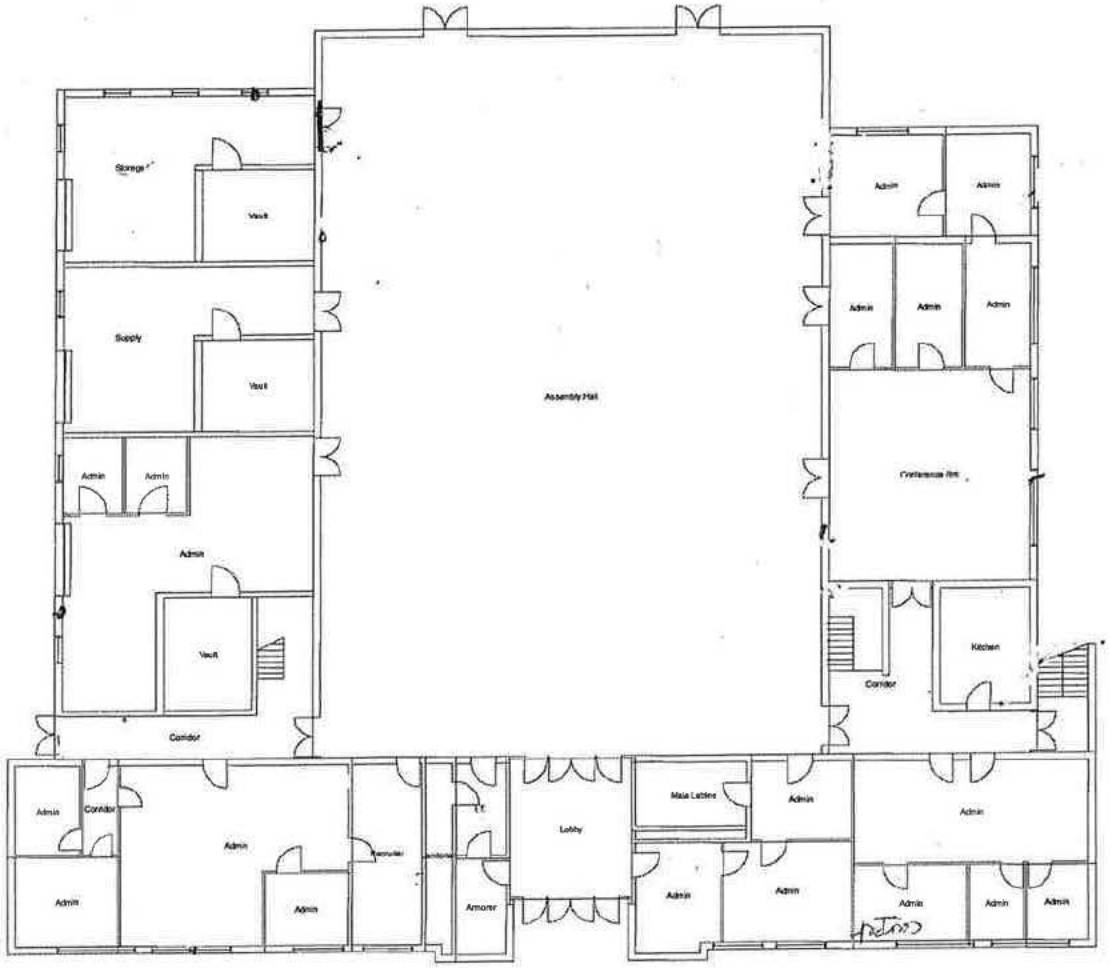
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

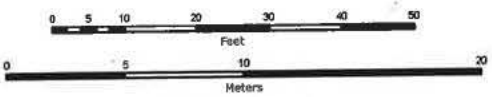
APPENDIX A

SHOP DRAWING

LEXINGTON - 25B50
1stFloor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE



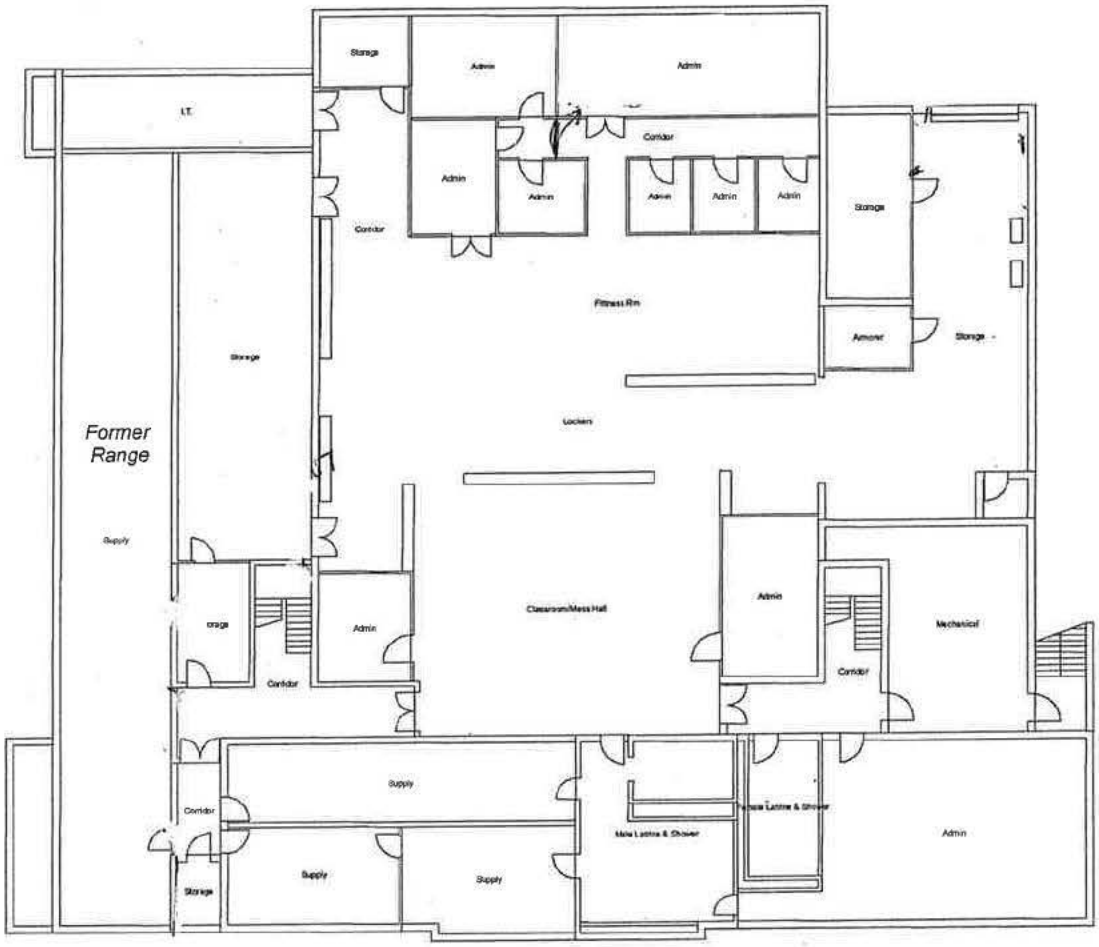


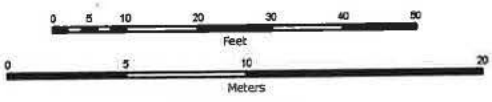
Massachusetts 1:200 NAD83/WGS84
The information on this map is for planning purposes only.
This information is not adequate for legal boundary definition,
regulatory interpretation, or parcel-level analysis.

23 February 2012

LEXINGTON - 25B50
Basement Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE





Massachusetts 1:200 NAD83/W0384

The information on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis.

23 February 2012

APPENDIX B

PERSONNEL LIST

459 Bedford St. Lexington MA

211th MP BN

Non-Responsive


Non-Responsive

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515618
Address:	301-lH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	459 Bedford Street, Lexington, MA	**Date Submitted:**	4/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Lexington, RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/24/2013

Report Date: 4/24/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13054223	LexingtonRC Wipe 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054224	LexingtonRC Wipe 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054225	LexingtonRC Wipe 03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054226	LexingtonRC Wipe 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054227	LexingtonRC Wipe 05	Flame	Wipe	****	0.108	110	ug/ft²	46	430	ug/ft²	
13054228	LexingtonRC Wipe 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054229	LexingtonRC Wipe 07	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13054230	LexingtonRC Wipe 08	Flame	Wipe	****	0.108	110	ug/ft²	20	190	ug/ft²	
13054231	LexingtonRC Wipe 09	Flame	Wipe	****	0.108	110	ug/ft²	58	540	ug/ft²	
13054232	LexingtonRC Wipe 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13054233	LexingtonRC Wipe FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515618
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	459 Bedford Street, Lexington, MA	**Date Submitted:**	4/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Lexington, RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/24/2013

Report Date: 4/24/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13054234	LexingtonRC LBP 01	Flame	Paint Chip	****	N/A	0.0092	%Pb		<0.0092	%Pb	
13054235	LexingtonRC LBP 02	Flame	Paint Chip	****	N/A	0.0088	%Pb		0.096	%Pb	
13054236	LexingtonRC LBP 03	Flame	Paint Chip	****	N/A	0.009	%Pb		0.026	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **515618**

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA IARNG
2. Job Location: 454 Bedford St, Lexington, MA
3. Job #: Lexington RC P.O. #: W912K8-09-A-0002
4. Contact Per: [redacted] Non-Responsive
5. Submitted b: [redacted] Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): → private

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ Email: [redacted] Non-Responsive .us.com
Comments:	☐ 2 Day Date Due: 4/24/13	☐ Fax: [redacted] @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ver [redacted] @us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 _____ (QTY)
- ☐ Fiberglass _____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA _____ (QTY)
- ☐ NIOSH 7402 _____ (QTY)
- ☐ Other (specify _____) _____ (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 3 (QTY)
- ☐ EPA Point Count _____ (QTY)
- ☐ NY State Friable 198.1 _____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 _____ (QTY)
- ☐ Other (specify _____) _____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM ___ (Qual) PLM ___ (Quan) PLM/TEM ___ (Qual) PLM/TEM ___ (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield _____ (QTY)
- ☐ NY State PLM/TEM _____ (QTY)
- ☐ Residual Ash _____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust _____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 _____ (QTY)
- ☐ Quan. (s/area)Dust D6480-99 _____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) _____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 _____ (QTY)
- ☐ EPA 100.1 _____ (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples _____ °C)

Metal Analysis
- ☒ Pb Paint Chip 3 (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 11 (QTY)
- ☐ Pb Air _____ (QTY)
- ☐ Pb Soil/Solid _____ (QTY)
- ☐ Pb TCLP _____ (QTY)
- ☐ Drinking Water ☐ Pb ___ (QTY) ☐ Cu ___ (QTY) ☐ As ___ (QTY)
- ☐ Waste Water ☐ Pb ___ (QTY) ☐ Cu ___ (QTY) ☐ As ___ (QTY)
- ☐ Pb Furnace (Media _____) _____ (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples: _____
Collection Media _____
- ☐ Spore-Trap ___ (QTY)
- ☐ Surface Swab ___ (QTY)
- ☐ Surface Tape ___ (QTY)
- ☐ Other (Specify ___) ___ (QTY)
- ☐ Surface Vacuum Dust ___ (QTY)
- ☐ Culturable ID Genus (Media ___) ___ (QTY)
- ☐ Culturable ID Species (Media ___) ___ (QTY)

SAMPLE INFORMATION: CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WIPE AND OTHER	SWAB TRAP	TAPE	SWAB
Lexington RC Wipe-01	Cockpit	4/15/13		100cm²				X				X				
Lexington RC Wipe-02								X				X				
Lexington RC Wipe-03								X				X				
Lexington RC Wipe-04								X				X				
Lexington RC Wipe-05								X				X				
Lexington RC Wipe-06	Maintenance							X				X				
Lexington RC Wipe-07								X				X				
Lexington RC Wipe-08								X				X				
Lexington RC Wipe-09								X				X				
Lexington RC Wipe-10								X				X				
Lexington RC Wipe-FB	Field Blank			—				X				X				
Lexington RC Wipe-01	dull white paint							X			X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 4/17/13 @ 9AS Via: FedEx By (Print): [redacted]
2. Date/Time Analyzed: ___/___/___ @ ___ By (Print): ___
3. Results Reported To: ___ Via: ___ Date: ___/___/___ Time: ___ Initials: ___
4. Comments: ___

Non-Responsive

515608
pg 2 of 2

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA IARNG
2. Job Location: 454 Bedford St, Lexington, MA
3. Job #: [redacted]
4. Contact Pers[redacted]
5. Submitted By[redacted]

Reporting Information (Results will be provided[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS		REPORT TO:
☐ Immediate Date Due: ____ ☐ 24 Hours Time Due: ____ Comments: ____	☐ Immediate ☐ Next Day ☐ 2 Day	☐ 3 Day ☒ 5 Day + Date Due: ____	☒ Inclu[redacted]ith Report ☒ [redacted] urs.com ☐ Fax[redacted] us.army.mil ☐ Ver[redacted] us.army.mil

☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ____ (QTY)
- ☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ____ (QTY)
- ☐ NIOSH 7402 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 3 (QTY)
- ☐ EPA Point Count ____ (QTY)
- ☐ NY State Friable 198.1 ____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield ____ (QTY)
- ☐ NY State PLM/TEM ____ (QTY)
- ☐ Residual Ash ____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
- ☐ Quan. (s/area)Dust D6480-99 ____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ____ (QTY)
- ☐ EPA 100.1 ____ (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- ☒ Pb Paint Chip 3 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 11 (QTY)
- ☐ Pb Air ____ (QTY)
- ☐ Pb Soil/Solid ____ (QTY)
- ☐ Pb TCLP ____ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
- ☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
- ☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
- ☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
- ☐ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER	SPORE TRAP	TAPE	SWAB
Lexington RC LBP-03	green/beige paint	4/18/13						X			X					
Lexington RC LBP-03	gray/red paint							X			X					
Lexington RC PLM-0?	pipe elbow insulation						X				X					
Lexington RC PLM-0?							X				X					
Lexington RC PLM-0?							X				X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: ____

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515618
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	459 Bedford Street, Lexington, MA	**Date Analyzed:**	4/24/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Lexington, RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13054237	LexingtonRC PLM 01A	10	10	--	--	--	20	--	--	--	--	70	Elbow	Off-White	Homogeneous	PC	
13054238	LexingtonRC PLM 01B	20	20	--	--	--	20	--	--	--	--	60	Elbow	Off-White	Homogeneous	PC	
13054239	LexingtonRC PLM 01C	10	10	--	--	--	20	--	--	--	--	70	Elbow	Off-White	Homogeneous	PC	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515618
Address:	301-lH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	459 Bedford Street, Lexington, MA	**Date Analyzed:**	4/24/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Lexington, RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s** Non-Responsive

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OWI (410) 247-2024 — 159202 — 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **515618**

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA ARNG
2. Job Location: 459 Bedford St, Lexington, MA
3. Job #: Lexington RC PO #: W912K6-00-A-0003
4. Contact Pers[redacted]
5. Submitted By [redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due: ______
☐ 24 Hours Time Due: ______
Comments: ______

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day +
☐ 2 Day Date Due: 4/24/13
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Inc[redacted] with Report
☒ [redacted] urs.com
☐ Fax [redacted] @us.army.mil
☐ Ver[redacted] @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 ______ (QTY)
☐ Fiberglass ______ (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA ______ (QTY)
☐ NIOSH 7402 ______ (QTY)
☐ Other (specify ______) ______ (QTY)
PLM Bulk
☒ EPA 600 – Visual Estimate 3 (QTY)
☐ EPA Point Count ______ (QTY)
☐ NY State Friable 198.1 ______ (QTY)
☐ Grav. Reduction ELAP 198.6 ______ (QTY)
☐ Other (specify ______) ______ (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM __(Qual) PLM __(Quan) PLM/TEM __(Qual) PLM/TEM __(Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield ______ (QTY)
☐ NY State PLM/TEM ______ (QTY)
☐ Residual Ash ______ (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust ______ (QTY)
☐ Quan. (s/area) Vacuum D5755-95 ______ (QTY)
☐ Quan. (s/area) Dust D6480-99 ______ (QTY)
TEM Water
☐ Qual. (pres/abs) ______ (QTY)
☐ ELAP 198.2/EPA 100.2 ______ (QTY)
☐ EPA 100.1 ______ (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ______ °C)

Metals Analysis
☒ Pb Paint Chip 3 (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 11 (QTY)
☐ Pb Air ______ (QTY)
☐ Pb Soil/Solid ______ (QTY)
☐ Pb TCLP ______ (QTY)
☐ Drinking Water ☐ Pb ___(QTY) ☐ Cu ___(QTY) ☐ As ___(QTY)
☐ Waste Water ☐ Pb ___(QTY) ☐ Cu ___(QTY) ☐ As ___(QTY)
☐ Pb Furnace (Media ______) ______ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ______
Collection Media ______
☐ Spore-Trap ___(QTY) ☐ Surface Vacuum Dust ___(QTY)
☐ Surface Swab ___(QTY) ☐ Culturable ID Genus (Media ___) ___(QTY)
☐ Surface Tape ___(QTY) ☐ Culturable ID Species (Media ___) ___(QTY)
☐ Other (Specify ___) ___(QTY)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Lexington RC Wipe-01	Drumm	4/11/13		1ft²				X				X				
Lexington RC Wipe-02	|	|		|				X				X				
Lexington RC Wipe-03	|	|		|				X				X				
Lexington RC Wipe-04	|	|		|				X				X				
Lexington RC Wipe-05	|	|		|				X				X				
Lexington RC Wipe-06	Maintenance	|		|				X				X				
Lexington RC Wipe-07	|	|		|				X				X				
Lexington RC Wipe-08	|	|		|				X				X				
Lexington RC Wipe-09	|	|		|				X				X				
Lexington RC Wipe-10	|	|		|				X				X				
Lexington RC Wipe-FB	fieldblank	|		—				X				X				
Lexington RC LBP-01	drill white paint							X								

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 4 / 17 / 13 @ 9US Via: Fe[redacted]
2. Date/Time Analyzed: 4 / 24 / 13 @ ______ By (Print[redacted]
3. Results Reported To: ______
4. Comments: ______

BEST AVAILABL[redacted]

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA ARNG
2. Job Location: 454 Bedford St., Lexington, MA
3. Job #: LEXINGTON RC
4. Contact Per: [redacted] Non-Responsive
5. Submitted [redacted]

Reporting Information (Results will be provide[redacted] as reasonably feasible): [redacted] phone:

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)
☐ Next Day ☒ 5 Day +
☐ 2 Day Date Due:

REPORT TO:
☒ Include [redacted] with Report
[redacted] Non-Responsive [redacted] @us.army.mil
☐ Fax: [redacted] @us.army.mil
☐ Verbal [redacted]

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)

PLM Bulk
☒ EPA 600 – Visual Estimate 3 (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
☒ Pb Paint Chip 3 (QTY)
☒ Pb Dust Wipe (wipe type wipe) 11 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media 1 (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Lexington RC LBP-01	green/brick paint	4/15/13						X								
Lexington RC LBP-02	grey/tan paint							X								
Lexington RC PLM-03	pipe elbow insulation		1				X				X					
Lexington RC PLM-04							X				X					
Lexington RC PLM-05							X				X					

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Lexington RC	459 Bedford St., Lexington, MA	39743799

Photo No.	Date:
1	4/10/13

Description:

Extension cord used as permanent wiring beneath office desk.

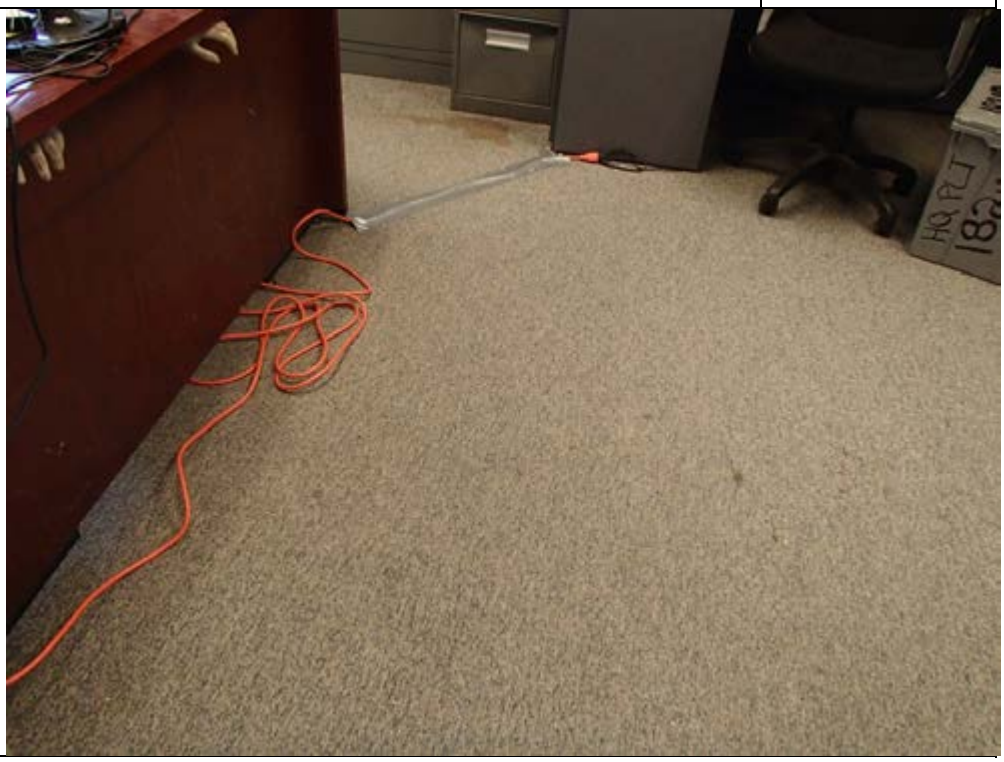

Photo No.	Date:
2	4/10/13

Description:

Improperly stored chemicals in Medics Office.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Lexington RC	459 Bedford St., Lexington, MA	39743799

Photo No.	Date:
3	4/10/13

Description:

Carpet duct taped across thresholds and walkways.

Photo No.	Date:
4	4/10/13

Description:

Blocked passageway in basement.

P:\Project\National Guard Bureau\39743798 H Services ME & MA\39743799 - MA Sites\Reports\Lexington RC\Lexington RC Photo Log docx

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
LYNN READINESS CENTER
36 SOUTH COMMON STREET
LYNN, MASSACHUSETTS

Non-Responsive
Office Manager

Non-Responsive
Project Manager

October 2005
PN: 39741508

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TABLE OF CONTENTS

Section Page

TABLE OF CONTENTS (cont.)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Peeling lead-based paint was present in bathroom #1, room #2, hallway #22 and room #11.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Lead was detected in wipe samples collected from the former firing range and drill hall in amounts greater than 200 $\mu g/ft^2$.	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Exposed pipe insulation ends and damaged 12"x12" floor tile were found in the boiler room and hallway #37.	Repair and/or remove all asbestos containing materials that are exposed. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was available.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan was available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Electrical Safety		
Electrical panels obstructed by equipment in the drill hall. Electrical panels must be kept clear of obstruction.	Remove all obstructions in front of electrical panels in the drill hall for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i))	RAC 2

FINDINGS AND RECOMMENDATIONS (Continued)

Findings	Recommendation	Risk Assessment Code
Mold		
Water damage was observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 36 South Common Street in Lynn, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On March 3, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Lynn, Massachusetts 01902. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr Non-Responsive of the Massachusetts Army National Guard was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 OPERATION DESCRIPTION

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chair armrests were in a fixed position and keyboards could not be adjusted in office #29 (Photos # 4121). If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

2.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 19.7% to 24.3% with an average of 22.2%. These readings were below the recommended comfort range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 433 to 542 parts per million (ppm), with an average of 486 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above background level. The average interior carbon dioxide was recorded below 700 ppm therefore no exterior reading was collected.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 ppm throughout the survey period. This measured level was below the ASHRAE (62.1-2004) guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Office # 28	Administrative Duties	211 / 19.6	500 / 50
Office # 29 – Desk	Administrative Duties	226 / 21.0	500 / 50
Office # 29 – Computer desk	Administrative Duties	270/ 25.1	500 / 50
Office # 31	Administrative Duties	451 / 41.9	500 / 50
Office # 34	Administrative Duties	274 / 25.5	500 / 50
Office # 35	Administrative Duties	380 / 35.3	500 / 50
Hallway # 37	Accessway	135 / 12.5	30 / 3
Hallway # 22	Accessway	115 / 10.7	30 / 3

On the day of the survey the illuminance in the administrative area was inadequate in all of the offices.

2.2.5 Lead

Seven paint chips were collected from areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. Five of the samples were found to contain lead in a concentration above the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Peeling lead paint was found in bathroom #1 (Photo # 4109), in room #2 (Photo # 4110), hallway #22 (Photo # 4111) and in room #11 (Photo # 4118). Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Bathroom #1	0303-LPC01	0.01	14
Bathroom #1	0303-LPC02	0.01	3.6
Room #2	0303-LPC03	0.01	28
Hall #22	0303-LPC04	0.01	28
Hall #22	0303-LPC05	0.01	0.17
Room #11	0303-LPC07	0.01	2.6
Room #24	0303-LPC08	0.01	0.12

The analytical report from AMA is contained in Appendix D

Wipe testing for lead was conducted using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Admin Hall #37 – Floor	0303-LW11	0.111	48	200
Admin Room #31 – Window Sill	0303-LW12	0.111	3200	200
Admin Room #30 – Top of Cabinet	0303-LW13	0.111	120	200
Admin Room #27 – Top of Locker	0303-LW14	0.111	36	200

Table 2-3 (Continued)
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Admin Hall #37 – Shelf	0303-LW15	0.111	130	200
Blank	0303-LW Blank	N/A	2.2	200

2.2.6 Asbestos

ATC Associates of Woburn, Massachusetts conducted an asbestos survey of this facility in August of 2000. Damaged asbestos containing 12"x12" floor tile was found in hallway # 37 (Photo # 4123) and room # 31 (Photo # 4131). Damaged white linoleum 12"x12" floor tile was found in room # 34 (Photo # 4122). These materials were not on ATC Associates asbestos survey report. Table 2-4 below presents the results of the samples collected by URS Corporation.

Table 2-4
Sample Results of Suspect ACM in the Administrative Area

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Office # 34	12"x12" White Floor Tile	0303-AB01A	NAD
Office # 34	12"x12" White Floor Tile	0303-AB01B	NAD

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation Of Results

GENERAL: In general, the administrative area was neat and orderly.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices. URS recommends increasing lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Five of the seven paint chips sampled contained lead in amounts greater than 0.5% classifying them as lead-based. These samples were collected from surfaces where the paint was peeling. These surfaces should be stabilized and the paint made intact by properly trained personnel. It is recommended that the peeling brown floor paint (0303-LPC07) be removed or encased.

Lead wipes collected from the administrative areas were all below the 200 micrograms per square foot limit established by the National Guard Bureau. The exception being the sample collected from the window sill in Room #31. This window sill and all others should be cleaned by properly trained personnel. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: No asbestos was detected in the two samples collected by URS in room #34.

MOLD: The water stains and damage on the ceilings and/or walls could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and is now used a locker room and for storage.

3.2 Chemical And Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Top of a Light Guard	0303-LW06	0.111	920	200
Former Firing Range-Top of a Locker	0303-LW07	0.111	68	200
Former Firing Range-Floor – Front	0303-LW08	0.111	1,300	200
Former Firing Range-Floor – Center	0303-LW09	0.111	800	200
Former Firing Range-Floor of the Bullet Trap	0303-LW10	0.111	18,000	200
Blank	0303-LWBlank	N/A	1.3	200

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0303-LA02	980	<3.1	50.0
Blank	0303-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.4 Interpretation Of Results

LEAD: Four of the five surface wipe samples collected within the former firing range were found to contain lead dust levels which exceed the maximum limit set by the NGB. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Appendix H provides guidance on the cleanup and rehabilitation of former indoor firing ranges.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is an 8,636 square foot area used for assembling personnel and storing equipment. The walls are constructed of brick with a wood floor.

4.2 Chemical And Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Floor – Rear	0303-LW01	0.111	370	200
Drill Hall – Floor – Right Center	0303-LW02	0.111	480	200
Drill Hall – Floor – Right Front	0303-LW03	0.111	150	200
Drill Hall – Top of the Coca Cola Machine	0303-LW04	0.111	590	200
Drill Hall – Top of a Table	0303-LW05	0.111	41	200
Blank	0303-LWBlank	N/A	1.3	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0303-LA01	1088	<2.8	50.0
Blank	0303-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal protective Equipment

Not applicable to this operation.

4.6 Interpretation Of Results

LEAD: Three of the five surface wipe samples taken within the drill hall were found to contain lead dust levels which exceed the maximum limit set by the NGB. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

5.0 BOILER ROOM / BASEMENT AREA

5.1 Operation Description

The boiler room is a mechanical space made of cinder block walls with a concrete floor containing, a furnace and associated piping.

5.2 Chemical And Physical Agents Sampled

5.2.1 Lead

One paint chip was collected where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 7	0303-LPC06	0.01	0.11

The analytical report from AMA is contained in Appendix D.

5.2.2 Asbestos

A few exposed ends of air cell pipe insulation were found in the boiler room (Photo's # 4113-14 & 4116).

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

LEAD: The paint chip sample collected in the boiler room was found to contain an acceptable level of lead, below 0.5% by weight.

ASBESTOS: Exposed end to asbestos-containing pipe insulation should be repaired (covered) by a Commonwealth of Massachusetts licensed Asbestos Abatement Contractor or other appropriately trained personnel.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazardous Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 55-2004: Thermal Environmental Conditions for Human Occupancy

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

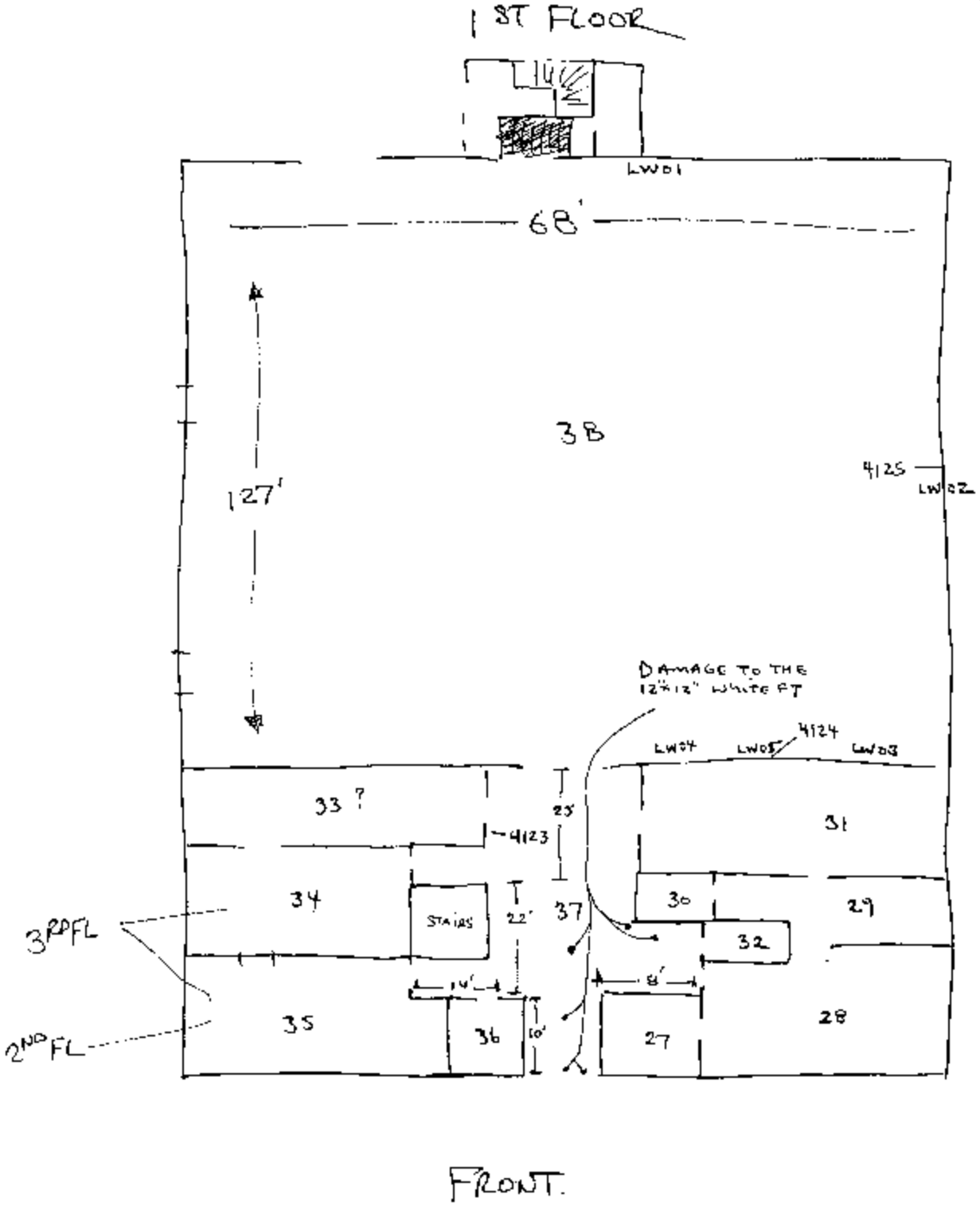
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING


1ST FLOOR
LW01
68'
127'
38
4125
LW02
DAMAGE TO THE 12"x12" WHITE FT
LW04
LW05
4124
LW03
33
25'
4123
31
34
STAIRS
22'
37
30
29
32
3RD FL
14'
8'
35
36
10'
27
28
2ND FL

FRONT.

LYNN, MA.

URS

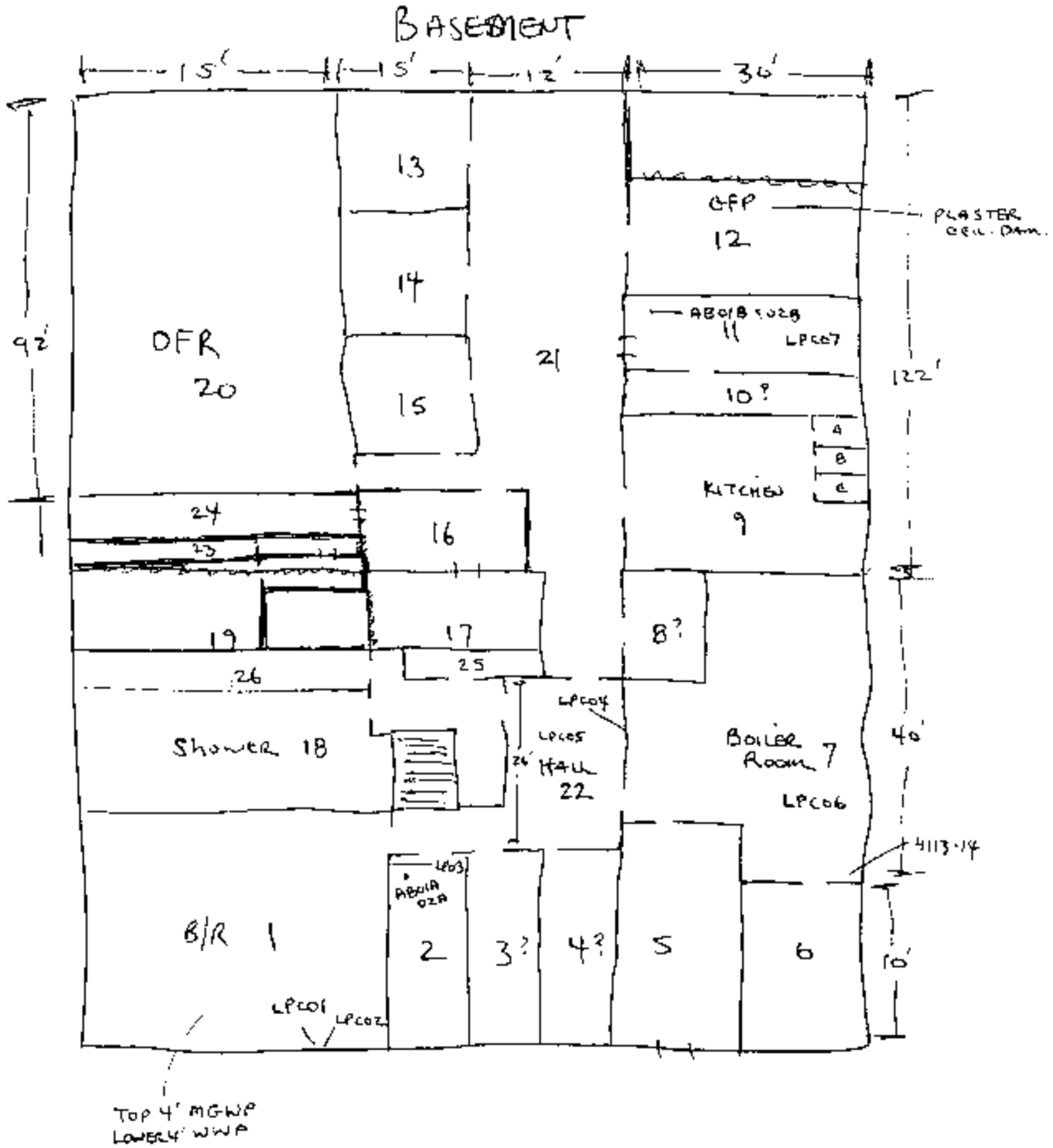
Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference



MGWP = MINT GREEN WALL PAINT.
WWP = WHITE WALL PAINT.

APPENDIX B

PERSONNEL LIST

PERSONEL LIST
LYNN ARMORY

Name	Rank
Non-Responsive	SFC
	CPL
	SGT

BEST AVAILABLE COPY

APPENDIX C

HAZARDOUS MATERIALS LIST

NOT AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123989
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	36-38 South Common Street; Lynn MA	**Date Analyzed:**	03/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-Mar-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0432349	0303-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	14	%Pb	
0432350	0303-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	3.6	%Pb	
0432351	0303-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	28	%Pb	
0432352	0303-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	28	%Pb	
0432353	0303-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.17	%Pb	
0432354	0303-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.11	%Pb	
0432355	0303-LPC 07	Flame	Paint Chip	****	N/A	0.01	%Pb	2.6	%Pb	
0432356	0303-LPC 08	Flame	Paint Chip	****	N/A	0.01	%Pb	0.12	%Pb	
0432357	0303-LW 01	Flame	Wipe	****	0.111	108.01	ug/ft^2	370	ug/ft^2	
0432358	0303-LW 02	Flame	Wipe	****	0.111	108.01	ug/ft^2	480	ug/ft^2	
0432359	0303-LW 03	Furnace	Wipe	****	0.111	67.51	ug/ft^2	150	ug/ft^2	
0432360	0303-LW 04	Flame	Wipe	****	0.111	108.01	ug/ft^2	590	ug/ft^2	
0432361	0303-LW 05	Furnace	Wipe	****	0.111	6.75	ug/ft^2	41	ug/ft^2	
0432362	0303-LW 06	Flame	Wipe	****	0.111	108.01	ug/ft^2	920	ug/ft^2	
0432363	0303-LW 07	Furnace	Wipe	****	0.111	13.50	ug/ft^2	68	ug/ft^2	
0432364	0303-LW 08	Flame	Wipe	****	0.111	108.01	ug/ft^2	1300	ug/ft^2	
0432365	0303-LW 09	Flame	Wipe	****	0.111	108.01	ug/ft^2	800	ug/ft^2	
0432366	0303-LW 10	Flame	Wipe	****	0.111	108.01	ug/ft^2	18000	ug/ft^2	
0432367	0303-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30	ug	1.3	ug	
0432368	0303-LA 01	Flame	Air	1088	N/A	2.76	ug/m^3	< 2.8	ug/m^3	

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123989
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	36-38 South Common Street; Lynn MA	**Date Analyzed:**	03/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-Mar-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0432369	0303-LA 02	Flame	Air	980	N/A	3.06	ug/m³	<	3.1	ug/m³	
0432370	0303-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted]ical Manager: [redacted]

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123989
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation Havre de Grace, Maryland 21078	**Job Location:**	36-38 South Common Street; Lynn MA	**Date Analyzed:**	03/16/2004
		Job Number:	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0432371	0303-AB 01 A	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	CK	
0432372	0303-AB 01 B	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	CK	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

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Lynn MA

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARMORY	**Chain Of Custody:**	140922		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Submitted:**	6/15/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	6/20/2005	**Report Date:**	20-Jun-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

Page 1 of 1

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0545798	0303-LW11	Furnace	Wipe	****	0.111	13.50	ug/ft²	48	ug/ft²	
0545799	0303-LW12	Furnace	Wipe	****	0.111	1687.67	ug/ft²	3200	ug/ft²	
0545800	0303-LW13	Furnace	Wipe	****	0.111	13.50	ug/ft²	120	ug/ft²	
0545801	0303-LW14	Furnace	Wipe	****	0.111	13.50	ug/ft²	36	ug/ft²	
0545802	0303-LW15	Furnace	Wipe	****	0.111	13.50	ug/ft²	130	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

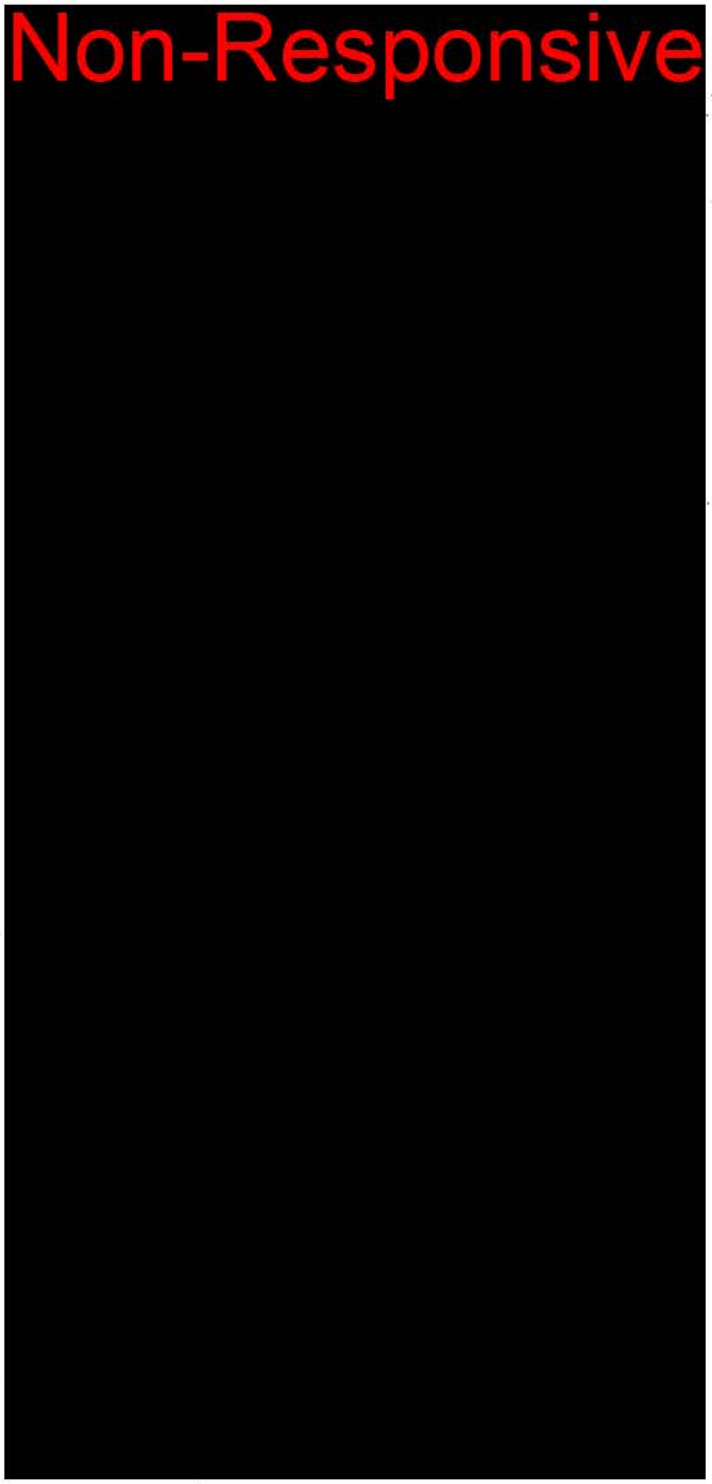
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive Technical Manager: [redacted]

APPENDIX E

TRAINING CERTIFICATES


Non-Responsive

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

April 10, 2004
Expiration Date

03518010625349
Certificate Number

[redacted]
President/Director of Training

APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (200 $\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

APPENDIX G

PHOTOGRAPHS

Photo 4109: Bathroom #1 – Peeling mint green paint (lead-based)

Photo 4110: Room #2 – Peeling gold paint (lead-based)

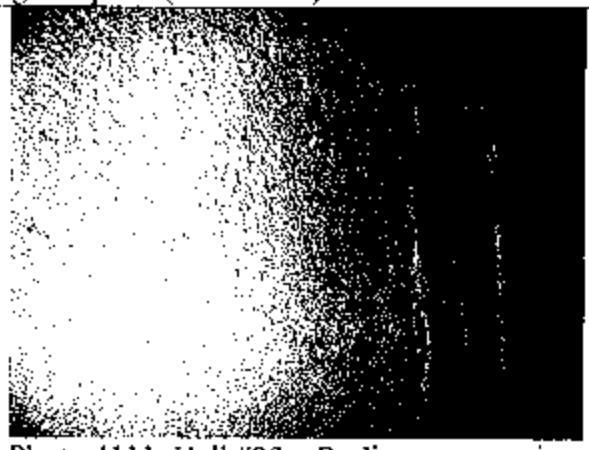


Photo 4111: Hall #22 – Peeling cream paint (lead-based)

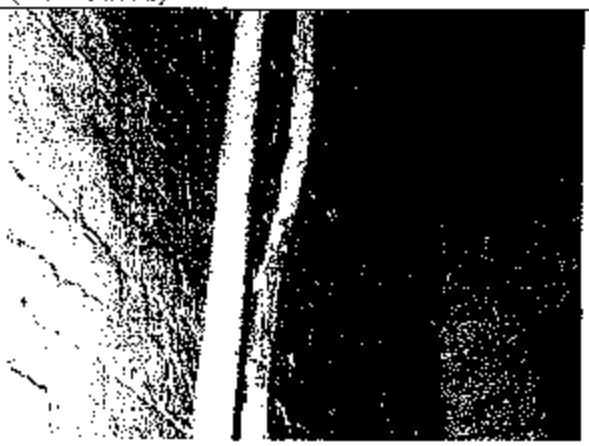


Photo 4113: Boiler Room #7 – Asbestos-containing pipe insulation with exposed end

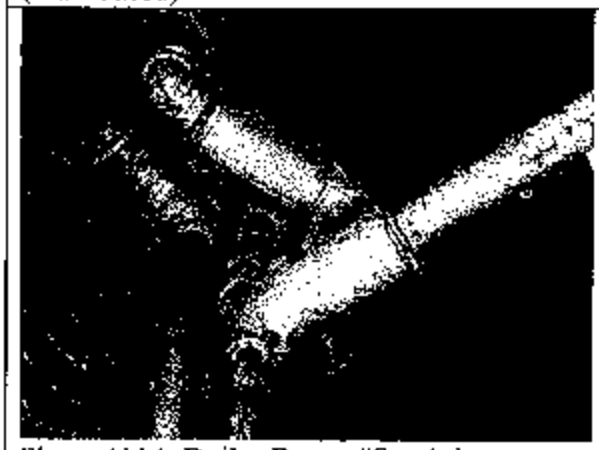


Photo 4114: Boiler Room #7 Asbestos-containing pipe insulation with exposed end

Photo 4116: Boiler Room #7 – Asbestos-containing pipe insulation with exposed end

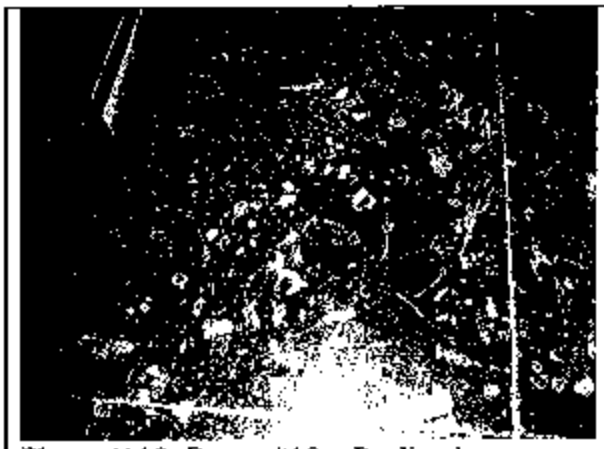


Photo 4118: Room #18 Peeling brown floor paint (lead-based)

Photo 4120: Room #31 – Water damaged floor tile

Photo 4121: Room #29 Computer workstation

Photo 4122: Room #34 – Damaged asbestos-containing floor covering

Photo 4123: Hall #37 – Damaged asbestos-containing floor tile

Photo 4124: Drill Shed #38 – Obstructed electrical panel

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

NGB-AVS

5 December 2001

MEMORANDUM FOR THE ADJUTANTS GENERAL OF ALL STATES, PUERTO RICO, THE US VIRGIN ISLANDS, GUAM, AND THE COMMANDING GENERAL OF THE DISTRICT OF COLUMBIA

SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

1. References:

a. AR 385-63, Policy and Procedures, 15 November 1983.

b. DODI 6055.9-STD, DOD Ammunition and Explosive Safety Standards, August 1997.

c. DODIG Report #98-170, subject: ARNG and U.S. Army Reserve Command Small Arms IFR, 30 June 1998.

d. AR 385-10, The Army Safety Program, 29 February 2000.

e. All States Memorandum, NGB-AVS, 18 September 2000, subject: (All States Log Number P00-0059) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges.

2. The policy and procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges are enclosed. Guidelines for Rehabilitation, Conversion, and Cleaning of IFRs are provided in the Addendum. These policies apply to all persons responsible for the operation, rehabilitation, conversion, and cleaning of ARNG IFR and satisfy the requirements of the references listed above.

3. The enclosed document contains sample formats of the forms necessary for the routine operation of IFRs. Additionally, an IFR Standing Operating Procedure is provided to assist each State/Territory in developing local guidance consistent with the needs of the individuals that use their range(s).

4. The contents of this memorandum will be incorporated into the revision of NGR 385-15, Policy and Responsibilities for Evaluation, and Operation of ARNG Indoor Firing Ranges, and National Guard Pamphlet 385-15, Guidance and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

NGB-AVS
SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning Inspection

5. This memorandum expires 30 November 2002, unless sooner rescinded or superseded.

6. Point of contact is Colonel Non-Responsive Chief, Aviation and Safety Division, at DSN 327-7700 or 703-607-7700.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

Non-Responsive

Encl
as

Lieutenant General, GS
Director, Army National Guard

CF:
NGB-IG
NGB-ART
NGB-ARO
NGB-ARE
NGB-ARI
NGB-ARS
NGB-PL
NGB-ARZ-PC
Each State IG
Each State Safety Office
Each State Occupational Health Nurse
Each State Training Site Commander
Each State USPFO
Each Regional Industrial Hygienist

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Contents — Paragraph

Appendices
- Appendix A - Abbreviations
- Appendix B - References
- Appendix C - Indoor Firing Range Accident Response Plan
- Appendix D - Permission and Release of Liability Certificate

Addendum
- Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning

1-1. General
This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

1-2. Explanation of abbreviations and terms
Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

1-3. Policy
a. Ammunition shall only be fired in properly classified indoor firing ranges.
b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
f. New ranges shall be designed using the latest standards provided by NGB-ARI.
g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

Responsibilities

1-4. Director, Army National Guard (DARNG)
The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

1-5. Chief, Aviation and Safety (NGB-AVS)
The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:
a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
b. Coordinate with other HQDA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall- -
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

1-7. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-8. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall- -

a. Provide the design standards for the construction of indoor firing ranges.

b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

1-9. The State Adjutant General
The State Adjutant General shall- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.

c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

1-10. State Safety Manager
State Safety Managers shall--

a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.

b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.

c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.

d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.

e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

f. Approve the use of the range by non-military organizations.

g. Maintain copies of all range inspections, ventilation measurements and visitors log.

1-11. State Occupational Health Nurse
The Occupational Health Nurse shall- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.

b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.

d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

1-12. State Environmental Office
The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

1-13. Facility Commanders
Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.

b. Indoor firing ranges are secured when not in use.

c. A custodian is appointed for all indoor firing ranges under his/her area of command.

d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.

e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.

f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.

g. All required signs are posted IAW Section 1-22 of this regulation.

h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.

i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).

j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.

k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.

m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.

n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).

o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter (mg/m^3).

p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.

q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.

r. The ventilation system is in operation at all times during firing or cleaning.

1-14. Range Custodians
Custodians shall- -

a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.

b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

1-15. Unit Commanders

Unit Commanders shall- -

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using **"limited use"** firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as **"limited use"** ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

1-16. Procedures, classification and use

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

1-17. Classification of ranges

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as **"safe"**, **"limited use"** or **"unsafe"**. **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in OG 415-1, Appendix A or CEHND 1110-1-18).

(1) Safe ranges.

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

(2) Unsafe ranges.

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

b. **Ventilation**

(1) Safe ranges.

(a) The range has an operational mechanical ventilation system.

(b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).

(c) Air is exhausted at or behind the bullet trap.

(d) Supplied air is introduced into the range behind the shooters.

(e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.

(f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.

(h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of water gauge (wg) but does not exceed -.20 wg.

(i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)

(j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.

(k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

(2) Unsafe ranges.

(a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.

(b) The range has no mechanical ventilation.

(c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.

(d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.

(e) Air is exhausted anywhere other than at the bullet trap.

(f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.

(g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -. 05 wg or in excess of -. 2 wg.

(h) The range is under positive pressure.

(i) The supply and exhaust air systems are not electrically interlocked.

c. **Range lighting.**

(1) Safe ranges.

(a) Lighting is uniform, non-glaring and does not cause shadows.

(b) Illumination is at least 100 foot candles on the targets and 30 foot- candles in all other areas.

(c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.

(d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.

(e) Emergency lights are provided behind the firing line and are in working condition.

(f) Exit lights are provided as required.

(g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

(2) Unsafe ranges.

(a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. **Bullet traps.**

(1) **Safe ranges.**

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.

(c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

(2) **Unsafe ranges.**

(a) Steel bullet traps are bowed, punctured or severely pitted.

(b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

e. **Targets and target carriers.**

(1) **Safe ranges.**

(a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).

(b) Only paper targets are used.

(2) **Unsafe ranges.** Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

f. **Lead levels.**

(1) **Safe ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels do not exceed 0.05 mg/m^3.

(b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed 0.03 mg/m^3.

(c) For personnel under the age of 18, see Figure 1-1.

(2) **Limited use ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels exceed 0.05 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed 0.03 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample.

(3) **Unsafe ranges.**

Lead levels in air sample results exceed 0.4 mg/m^3 in any breathing zone or general area sample.

1-18. Range use

a. Indoor firing ranges shall not be used for any purpose other than firing. (I.e., they shall not be used for classrooms, exercise rooms, storage, etc.).

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

1-19. Prohibitions

a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.

c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.

d. Variable speed fans are *not* permitted.

e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.

f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.

g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.

h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.

I. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.

j. There are no open floor drains in the range.

k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

1-20. Personal protective equipment

a. **Eye protection.** All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection.

b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.

c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

1-21. Posting warning signs

a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:

(1) Eating, Drinking and Smoking are *prohibited*

(2) Dry Sweeping is *prohibited*

(3) Wash Hands and Face Immediately Following Firing

(4) Only the Following Ammunition is *authorized* for use on this Range: _____

(5) Hearing Protection *shall be* properly worn during firing

(6) Proper Safety Glasses/Goggles *shall be* worn during firing

(7) Furniture or storage of other items of equipment is *not* permitted in the range

b. The following signs shall be posted on the entrance door to the range:

(1) Noise Hazardous Area

(2) Danger Lead Hazard Area

(3) Pregnant women are *not* permitted in this area.

c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.

e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

Note: All signs shall meet the requirements of DA Pam 385-64.

1-22. Range Standing Operating Procedures.

a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

(a) Name and age of shooter.

(b) Organizations (if civilian, include address and phone number).

(c) Sign-in and sign-out times and date.

(d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

1-23. Inspection requirements.

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

1-24. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

1-25. Annual Inspections

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

1-26. Ventilation requirements

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

1-27. Air sampling requirements

a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m^3 sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(ii).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

1-28. Inspection reports

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

1-29. Record maintenance

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

1-30. Control of potential Lead intoxication

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

(1) A description of each operation where Lead is emitted;
(2) Methods used to achieve compliance;
(3) Methods used to meet the permissible exposure level;
(4) Air monitoring data, which documents the source of air emissions;
(5) A detailed schedule for implementation of the program;
(6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
(7) Administrative control schedule;
(8) Personnel enrollment in medical surveillance;
(9) Other relevant information.

b. Refer to TG 206 for specific guidance on developing the compliance program.

1-31. Alternative ammunition

a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

1-32. Maintenance requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline static pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

(5) Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

1-33. Housekeeping

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are ¾ full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

1-34. Maximum exposure hours
Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m^3 or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed 0.03 mg/m^3. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

1-35. Extent of use
a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m^3. For ranges with Lead concentrations less than 0.100 mg/m^3, follow the guidelines in Figure 1-1.
d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

1-36. Medical surveillance
a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m^3) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

1-37. Terms
a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

FIGURE 1-1

0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 – 0.499	0.75	0.5	0
0.500 – 0.749	0.5	0.25	0
0.750 – 0.999	0.25	0.25	0
1.000 or above	0	0	0

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range _____ Date _____

Range Custodian _____ Telephone _____

Part 1, Physical Safety Inspection

A. Building Envelope

_____ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]

_____ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17a(1)(d)]

_____ 4. There are no open floor drains in the range. [1-17a(2)(c)]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]

_____ 7. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]

_____ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]

_____ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))

_____ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))

_____ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))

_____ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]

_____ 6. Exit lights are provided and working as required. [1-17c(1)(f)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, the Addendum, and this regulation. [1-17d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]

_____ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]
(Any one firing lane without a retrieval system shall not be used for firing)

_____ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]

_____ 3. Only paper targets are used in the range. [1-17e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [1-18a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]

_____ 3. No additional clothing or equipment is brought into the range. [1-19h]

_____ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-19a]

_____ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]

_____ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]

_____ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

F. Range maintenance

_____ 1. Dry sweeping does not occur in the range. [1-19e]

_____ 2. No brooms are located in the range. [1-19e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
- _____ a. Eating, Drinking and Smoking are *Prohibited*
- _____ b. Dry Sweeping is *Prohibited*
- _____ c. Wash Hands and Face Immediately Following Firing
- _____ d. The Following Ammunition is authorized for use on this Range: _____
- _____ e. Hearing Protection *shall be* Properly worn during firing
- _____ f. Proper Safety Glasses/Goggles *shall be* worn during firing
- _____ g. No Furniture or Storage of Items Permitted in the Range

_____ 2. The following signs are posted on the entrance door to the range: [1-21b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant women are *not* permitted in this Area

_____ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters. [1-21c]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

_____ 2. The range SOP includes as a minimum the following: [1-22b]

_____ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

_____ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

_____ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

_____ d. Instructive guidance for all range procedures.

_____ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

_____ f. Authorized ammunition for the range.

_____ g. The requirement for posting of signs IAW section 1-21 of this regulation.

_____ h. Cleaning and maintenance requirements.

_____ i. Personal protective equipment requirements for maintenance, firing and cleaning.

J. Recordkeeping

_____ 1. A visitors log is maintained which includes the following information for all visitors/shooters: [1-14c]

_____ a. Name and age of shooter.

_____ b. Organization (if civilian, include address and phone number).

_____ c. Sign in and sign out times.

_____ d. Type of ammunition used and number of rounds fired.

_____ 2. Copies of initial and other previous inspections are available. [1-24a]

_____ 3. The initial inspection report includes air-sampling data. [1-24b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

_____ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

_____ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

_____ 7. Range safety officer(s) is/are designated. [1-13c]

K. New and Renovated Ranges

_____ 1. No doors are installed in the plenum wall.

_____ 2. Plenum area is at least 4 feet deep.

_____ 3. An access door is installed behind the bullet trap.

_____ 4. Only escalator or rubber bullet traps are installed.

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 2, Ventilation Inspection

A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]

_____ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]

_____ 4. Make-up air is introduced into the range behind the shooters. [1-17b(1)(d)]

_____ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [1-17b(1)(e)]

_____ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [1-17b(1)(f)]

_____ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]

_____ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]

_____ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii)]

_____ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails.
[29 CFR 1910.1025(e)(4)(ii)]

_____ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, 3-2a]

_____ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]

_____ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]

_____ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]

_____ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

B. New and Renovated Ranges

_____ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.

_____ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.

_____ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 4. Passive supply systems have opposing blade louvers.

_____ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____

2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____

3. Air sampling has been scheduled for: _____

Print and sign: _____

Position: _____ Date: _____

4. Air sampling was completed on: _____ for the following types of ammunition: _____.

5. Air sample results do not exceed: _____ mg/m^3 (results are attached)

6. For military personnel exposed less than 30 days per year, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

Print and sign: _____

Position: _____ Date: _____

FIGURE 1-3
EXAMPLE OF INDOOR FIRING RANGE SOP
STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXXX
_____ ARMORY INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

1. **References:**

a. AR 385-10
b. AR 385-63
c. NGR 385-10
d. NG PAM 385-XX
e. 29 CFR 1910.1025
f. 29 CFR 1920.1200
g. 29 CFR 1926
h. 29 CFR 1960
I. USACHPPM, TG 141

2. **Purpose.** The _____ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

3. **Review and Update.** This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

4. **General.**

a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.

b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

5. **Range Control.**

a. The _____ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

(1) Enforce the facility range safety program and SOP.

(2) Notify Armory personnel of times when the range shall be in use.

(3) Coordinate and schedule all activity on the firing range.

(4) Ensure that the range is secured when not in use.

(5) Ensure that nothing is stored at the range.

(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Safe Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCOIC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (**Appendix C** of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paragraph 1-21 are posted as required.

6. **Range OIC/NCIOC.** The Commander or supervisor of all using units or groups shall designate an OIC/NCOIC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range have singed-in on the roster maintained by the facility Commander.

(10) Ensure that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from _____ to _____ hours.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.

(3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.

(4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.

(5) Ensure that weapons are cleared and checked during temporary suspension of firing.

(6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

c. After Firing.

(1) Ensure that all weapons are cleared prior to being removed from the firing line.

(2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

(3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**

(4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

7. Range Control Officer Qualifications. His or her commander may appoint any individual in the rank of E-6 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

8. Range Restrictions.

a. The _____ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

EXAMPLE

(1) .22 caliber including the M-16 with adapter
(2) .38 caliber
(3) .45 caliber
(4) 9 mm pistols

Note: No other weapons can be fired without the approval of the State Safety Manager.

b. Pellets, BBs, magnum and armor piercing rounds are prohibited.

c. Dry sweeping of the range is prohibited.

d. Trick shooting including, quick draw and hip shooting is prohibited.

e. Storage of any item in the range is prohibited.

f. Smoking and consumption of food or beverages is prohibited.

g. Proper hearing and eye protection shall be worn during firing.

h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.

I. Personnel shall not be allowed in the observation/plenum area during firing.

9. Mandatory Signs. As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

(1) Eating, drinking and/or smoking are prohibited.

(2) Dry sweeping is prohibited.

(3) Wash hands and face immediately after firing.

(4) Hearing protection shall be worn during firing.

(5) Safety glasses/goggles shall be worn during firing.

(6) Storage of furniture and other items is prohibited.

(7) The following ammunition is authorized for this range: _____, _____, _____, and _____.

b. On the Door to the Range.

(1) Noise Hazardous Area.

(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

10. **Authorized Use of the Range.** Utilization of the _____ Armory range is authorized for organizations of the _____ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of _____.

11. **Release of Liability.**

a. The military Range Control Officer shall obtain a signed Release of Liability (**Appendix D** of this SOP) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (**Appendix D** of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

12. **Denial of Range Access.** The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe
CPT, IN, ___ARNG
OIC/Armory Commander

APPENDIX A
ABBREVIATIONS

ANSI
American National Standards Institute

AR
Army Regulation

ARNG
Army National Guard

CFM
Cubic feet per minute

CFR
Code of Federal Regulations

CNGB
Chief, National Guard Bureau

DA
Department of the Army

FPM
Feet Per Minute

HEPA
High Efficiency Particulate Air

IAW
In Accordance With

IFR
Indoor Firing Range

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standing Operating Procedure

SP
Static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

wg
Inches of water gauge

APPENDIX B
REFERENCES

ACGIH 22nd Ed, Industrial Ventilation
A Manual of Recommended Practice

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 350-41
Army Forces Training

AR 385-63
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64
U.S. Army Explosives Safety Program

Army National Guard (ARNG) Design Guide (DG) 415-1
Design Guide for Armories

American National Standards Institute (ANSI) Z87.1-1999
Practice for Occupational and Educational Eye and Face Protection

CEHNO 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

Department of the Army Pamphlet (DA PAM) 385-64
U.S. Army Explosives Safety Program

DA PAM 40-501
Hearing Conservation

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges

FM 25-7
Training Ranges

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development

APPENDIX B (Continued)

GR 420-10
Operations/Maintenance and Minor Construction, Army National Guard

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TG 206
USACHPPM Technical Guide for Indoor Firing Ranges

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910
Occupational Safety and health Standards

APPENDIX C
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. **All weapons shall be cleared and muzzles pointed downrange.**

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. **The primary telephone to be used in case of an emergency is located _____. The emergency numbers are _____.**

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN _____, or the duty officer, and the State Safety and Occupational Health Office at DSN _____.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

APPENDIX D
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

_____ ARNG
Somewhere, USA
Date: _____

BE IT KNOWN TO ALL: WHEREBY I, _____;
Have been granted permission to use firearms on the indoor firing range located at the _____ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of ____ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of ____, the ____ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of ____, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: _____

Witness to Signature: _____

In case of emergency, please contact:
Name _____
Address _____
_____
Telephone Number _____

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.
I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: _____

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SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
- a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
- b. AR 11-34 (The Army Respiratory Protection Program).
- c. AR 40-5 (Preventive Medicine).
- d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
- e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
- f. OSHA Technical Manual, Edition VII.
- g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

[redacted]

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 8 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include--

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industriel Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

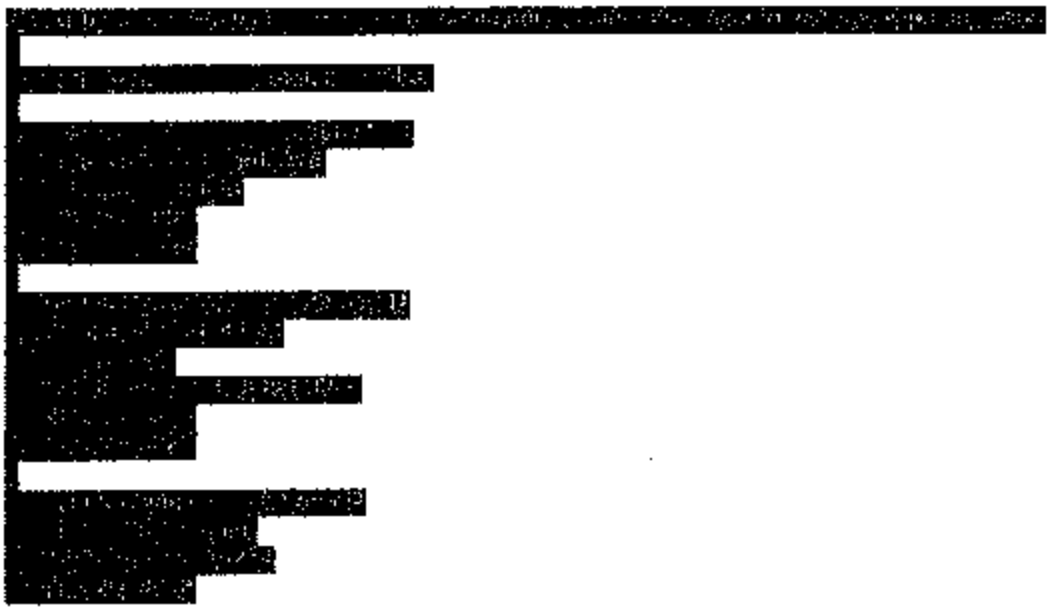
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

APPENDIX E (Continued)

800-247-6628
800-358-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

NGB-AVS-SG
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APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

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INDUSTRIAL HYGIENE SURVEY REPORT
MELROSE READINESS CENTER
120 MAIN STREET
MELROSE, MASSACHUSETTS

December 2005
PN: 39741508

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in most of the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Broken asbestos containing floor tile was found in the drill hall and a few other locations. Exposed asbestos pipe run and pipe fitting insulation was found in various locations.	Remove and replace the broken floor tile with non-asbestos replacement floor tiles. Repair or remove exposed asbestos pipe run and pipe fitting insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was not available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
The hazard communication plan available was not site specific.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910. 1200(e))	RAC 4

FINDINGS AND RECOMMENDATIONS (Cont)

Findings	Recommendation	Risk Assessment Code
Fire Safety		
An emergency exit sign was not illuminated in the drill hall.	Each exit sign must be illuminated to a surface value of at least five foot candles (54 LUX) by a reliable light source and be a distinctive in color (OSHA 29 CFR 1910.37(b)(6))	RAC 2
An obstructed fire extinguisher and hose was found in the drill hall.	Fire extinguishers and hoses must be made available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher (OSHA 29 CFR 1910.157 (c)(1)).	RAC 2
Mold		
Water damage was observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Confined Space		
A confined space extending from the boiler room has not been evaluated	The MA ARNG must determine if any confined spaces are permit required confined spaces (OSHA 29 CFR 1910.(c)(1))	RAC 3
Compressed Gas Cylinder		
An unmarked and unsecured compressed gas cylinder (Photo 4161) was located drill shed.	Compressed gas cylinders should be clearly marked and secured (OSHA 29 CFR 1910.101)	RAC 3

1.0 Summary

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located on 120 Main Street in Melrose, Massachusetts 02176. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On March 4, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted the site visit to the Melrose Readiness Center. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements and a review of site health and safety procedures. SGT Non-Responsive Non-Responsive of the Massachusetts ARNG was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 Administrative Area

2.1 Operation Description

This area includes multiple offices located throughout the building with desks and computer workstations. This area also includes the kitchen, classroom, janitor's closet, locker room, shower room, hallways and supply area. Some rooms could not be accessed because the full time unit in this building was currently stationed at Hanscom Air Force Base and they had the keys. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chair armrests were in a fixed position and keyboards could not be adjusted in office #12 (Photo # 4154). If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

Water marks and damage were observed on the ceilings and/or walls of office #12 (Photos # 4151-52), office # 23 (Photo # 4157), bathroom # 25 (Photo # 4158), hallway # 46 (Photo # 4166), mess hall # 43 (Photo # 4167), hallway # 49 (Photo # 4172) and room #5A (Photo # 4186).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 18.2% to 23.4% with an average of 19.8%. These readings were below the recommended comfort range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 442 to

534 parts per million (ppm), with an average of 486 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Exterior measurements were not collected since the average interior carbon dioxide was below 700 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. The carbon monoxide concentration remained at 0 ppm throughout the survey period. The measured level was below the ASHRAE guideline (62.1-2004) for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments includa internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, haadache, nausea, and confusion. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Office # 4	Administrative Duties	166 / 15.4	500 / 50
Office # 12	Administrative Duties	223 / 20.7	500 / 50
Office # 13	Administrative Duties	199 / 18.5	500 / 50
Office # 14	Administrative Duties	1186 / 110.2	500 / 50
Office # 21 – Front Desk	Administrative Duties	683 / 63.5	500 / 50
Office # 21 – Rear Desk	Administrative Duties	865 / 80.4	500 / 50
Office # 22	Administrative Duties	1201 / 111.6	500 / 50
Office # 23 – Front Desk	Administrative Duties	176 / 16.4	500 / 50
Office # 23 – Rear Desk	Administrative Duties	270 / 25.1	500 / 50
Office # 26	Administrative Duties	067 / 6.2	500 / 50
Hallway # 18	Accessway	275 / 25.5	30 / 3
Hallway # 48	Accessway	137 / 12.7	30 / 3

On the day of the survey the illuminance in the administrative area was inadequate in approximately half of the offices.

2.2.5 Lead

Two paint chips were collected where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. The samples were found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Classroom # 42	0304-LPC02	0.01	<0.01
Classroom # 42	0304-LPC03	0.01	<0.0084

The analytical report from AMA is contained in Appendix D

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Hallway # 17 – Top of a File Cabinet	0304-LW06	0.111	42	200
Office # 12 – Top of a Computer Desk	0304-LW07	0.111	21	200
Office # 14 – Top of a Window Sill	0304-LW08	0.111	64	200
Office # 23 – Top of a File Cabinet	0304-LW09	0.111	7	200
Hallway # 48 – Top of a Table	0304-LW10	0.111	19	200
Room # 42 – Floor	0304-LW11	0.111	17	200
Blank	0304-LWBlank	0.111	0.65	200

2.2.6 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA)

Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-4 below presents the results of the sample analysis.

Table 2-4
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Hallway # 2	Pipe Air Cell Insulation	0304-AB02B	85 (Chrysotile)
Office # 12	12"x12" Tan/Cream Floor Tile	0304-AB04A	NAD
Office # 12	12"x12" Tan/Cream Floor Tile	0304-AB04B	NAD
Office # 12	Skim Coat Plaster	0304-AB05A	NAD
Office # 12	Skim Coat Plaster	0304-AB05B	NAD
Office # 12	Base Coat Plaster	0304-AB06A	NAD
Office # 12	Base Coat Plaster	0304-AB06B	NAD
Room # 16	9"x9" Brown Floor Tile	0304-AB07A	2 (Chrysotile)
Room # 14	9"x9" Brown Floor Tile	0304-AB07B	2 (Chrysotile)

NAD = No Asbestos Detected

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, of the rooms we could access, the administrative area was neat and orderly.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in approximately half the offices. URS recommends increased lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: The six surface wipes and two paint chip samples collected in this area for lead were found to be within the allowable limits and require no further action at this time. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: Broken asbestos-containing floor tile was found in room # 16 (Photo # 4155), office # 14 (Photo # 4156), hallway # 46 (Photo # 4165), classroom # 42 (Photo # 4170), hallway # 49 (Photo # 4171) and in room # 26 (Photo # 4185). Severely damaged air cell pipe insulation was found in hallway # 2 (Photo # 4149), leading to the boiler room. It is recommended that the damaged tiles be removed and replaced with new, non-asbestos tile and that the air cell insulation be removed. An appropriately trained, licensed technician should perform this work.

MOLD: The water stains and damage on the ceilings and/or walls could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and is now primarily used as a locker room. This area was not accessible at the time of this survey. The full time unit for this armory was stationed at Hanscom Air Force Base and they had the keys to this area. It is recommended that the former firing range be tested for lead in the near future.

3.2 Chemical and Physical Agents Sampled

3.3 Lead

URS was unable to conduct testing in this area at the time of this survey.

3.4 Ventilation System Evaluation

Not applicable to this operation.

3.5 Noise Measurements

Not applicable to this operation.

3.6 Personal Protective Equipment

Not applicable to this operation.

3.7 Interpretation of Results

There are no results to report for this section.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,400 square feet area with about a 30 foot high ceiling, used for assembling personnel and storing vehicles. The walls are constructed of cinder blocks with a concrete floor.

An unmarked and unsecured compressed gas cylinder (Photo 4161) was located drill shed.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Top of the Coca Cola Machine	0304-LW01	0.111	44	200
Drill Hall – Top of a Locker	0304-LW02	0.111	840	200
Drill Hall – Floor – Rear	0304-LW03	0.111	390	200
Drill Hall – Floor – Center	0304-LW04	0.111	19	200
Drill Hall – Floor - Front	0304-LW05	0.111	6.8	200
Blank	0304-LWBLANK	N/A	0.65	200

One air sample for lead was collected in the drill hall. Table 4-2 below shows the result of the lead air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0304-LA01	1064	<2.8	50.0
Blank	0304-LA03	0	<3.0	50.0

On the day of the survey, the lead level in this area range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.10259(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

One paint chip was collected where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 4-3 below shows the results of the lead paint testing.

Table 4-3
Level of Lead in Paint Found in the drill hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room – Over Head Door	0304-LPC04	0.1	0.07

The analytical report from AMA is contained in Appendix D.

4.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA)

Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 4-4 below presents the results of the sample analysis.

Table 4-4
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Drill Hall # 31	12"x12" Cream Floor Tile	0304-AB08A	3 (Chrysotile)
Drill Hall # 31	12"x12" Cream Floor Tile	0304-AB08B	3 (Chrysotile)

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Two of the five surface wipe samples were found to contain lead above the maximum safe surface contamination level of 200 $\mu g/ft^2$. Recommend cleaning the areas of the drill hall where there were high levels of lead dust by personnel trained in accordance with the OSHA Lead standard (29 CFR 1910.1025). The NGB has

prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: Exposed air cell insulation was found in the drill hall (Photo # 4159). Random sections of broken floor tile were found in numerous areas (Photo # 4164). It is recommended that the insulation be removed and the damaged tiles be replaced with new, non-asbestos tile. An appropriately trained, licensed technician should perform this work.

FIRE SAFETY: At the time of this survey, a fire extinguisher was obstructed (Photo # 4160), an exit sign was not illuminated (Photo # 4162) and a fire hose was missing from its assigned location (Photo # 4163).

SAFETY: A compressed gas cylinder was not properly labeled and was not chained to the wall (Photo # 4161).

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

One paint chip was collected where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration within the allowable limits of the U.S. Housing end Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Level of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 1	0304-LPC01	0.01	0.04

The analytical report from AMA is contained in Appendix D

One air sample for lead dust was also collected in the boiler room. Table 5-2 below shows the result of this air sample.

Table 5-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Boiler Room	0304-LA02	1004	<3.0	50.0
Blank	0304-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the boiler room was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

5.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 5-3 below shows the results of these samples.

Table 5-3
Samples of Suspect ACM in the Boiler Room

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room # 1	Pipefitting Insulation	0304-AB01A	5 (Chrysotile)
Boiler Room # 1	Pipefitting Insulation	0304-AB01B	5 (Chrysotile)
Boiler Room # 1	Air Cell Pipe Insulation	0304-AB02A	65 (Chrysotile)
Boiler Room # 1	Flue Cement	0304-AB03A	NAD
Boiler Room # 1	Flue Cement	0304-AB03B	NAD

NAD = No Asbestos Detected

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

LEAD: The air and paint chip samples collected in this area were found to be within acceptable levels. No further action is required at this time.

ASBESTOS: Exposed pipe fitting (Photo # 4144) and pipe run insulation (Photos # 4145-46) was found in this area. The pipe chase appeared to contain damaged insulation (Photo # 4148).

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined space program is required to manage the pie chase that extends from Boiler Room #1.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 55-2004: Thermal Environmental Conditions For Human Occupancy

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

Appendix A

Shop Drawing

URS

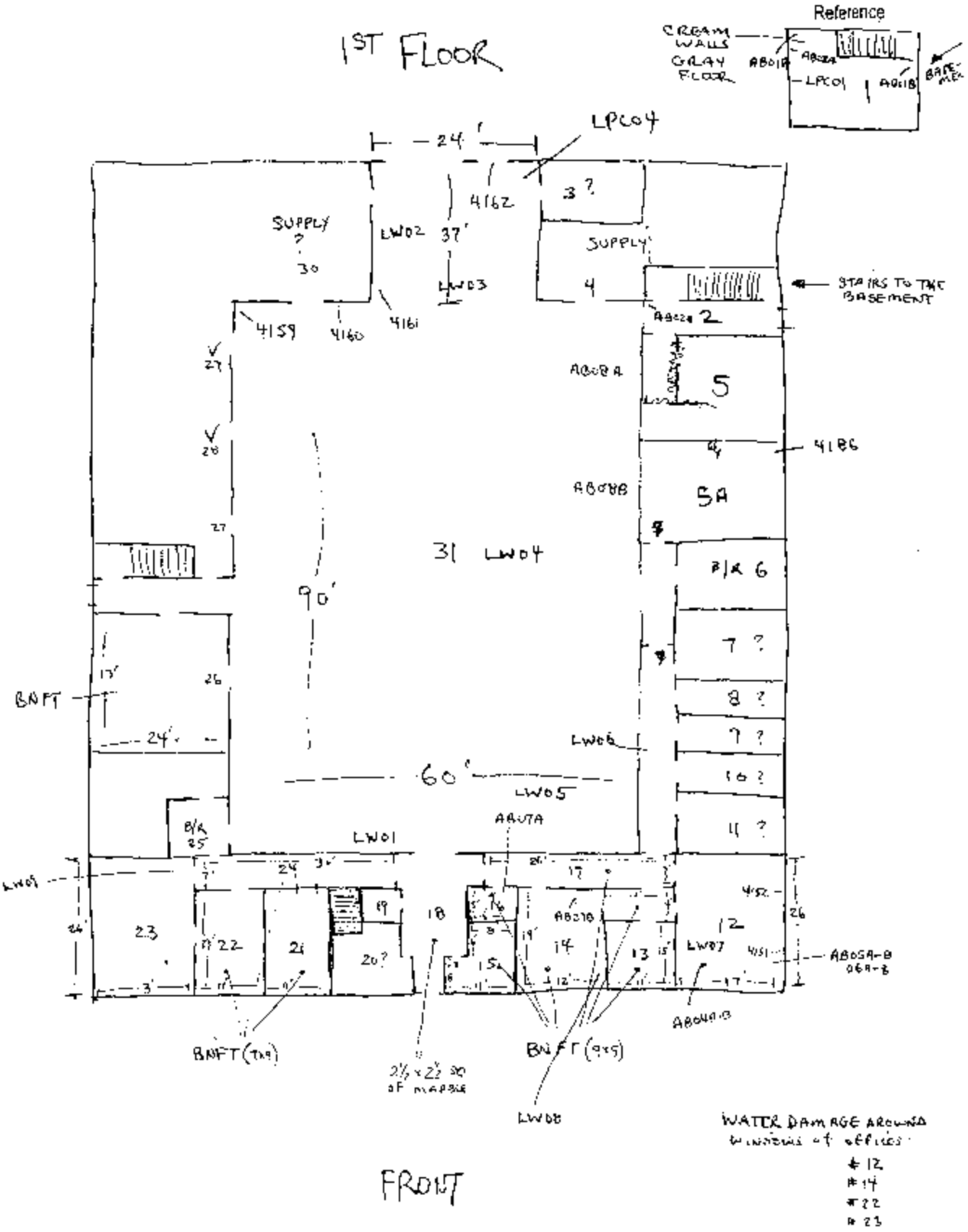
MELROSE, MA

Page ____ of ____

Job MELROSE, MA — Project No. ____ — Sheet ____ of ____

Description ____ — Computed by ____ — Date ____

Checked by ____ — Date ____



URS

MELROSE, MA.

Page ____ of ____

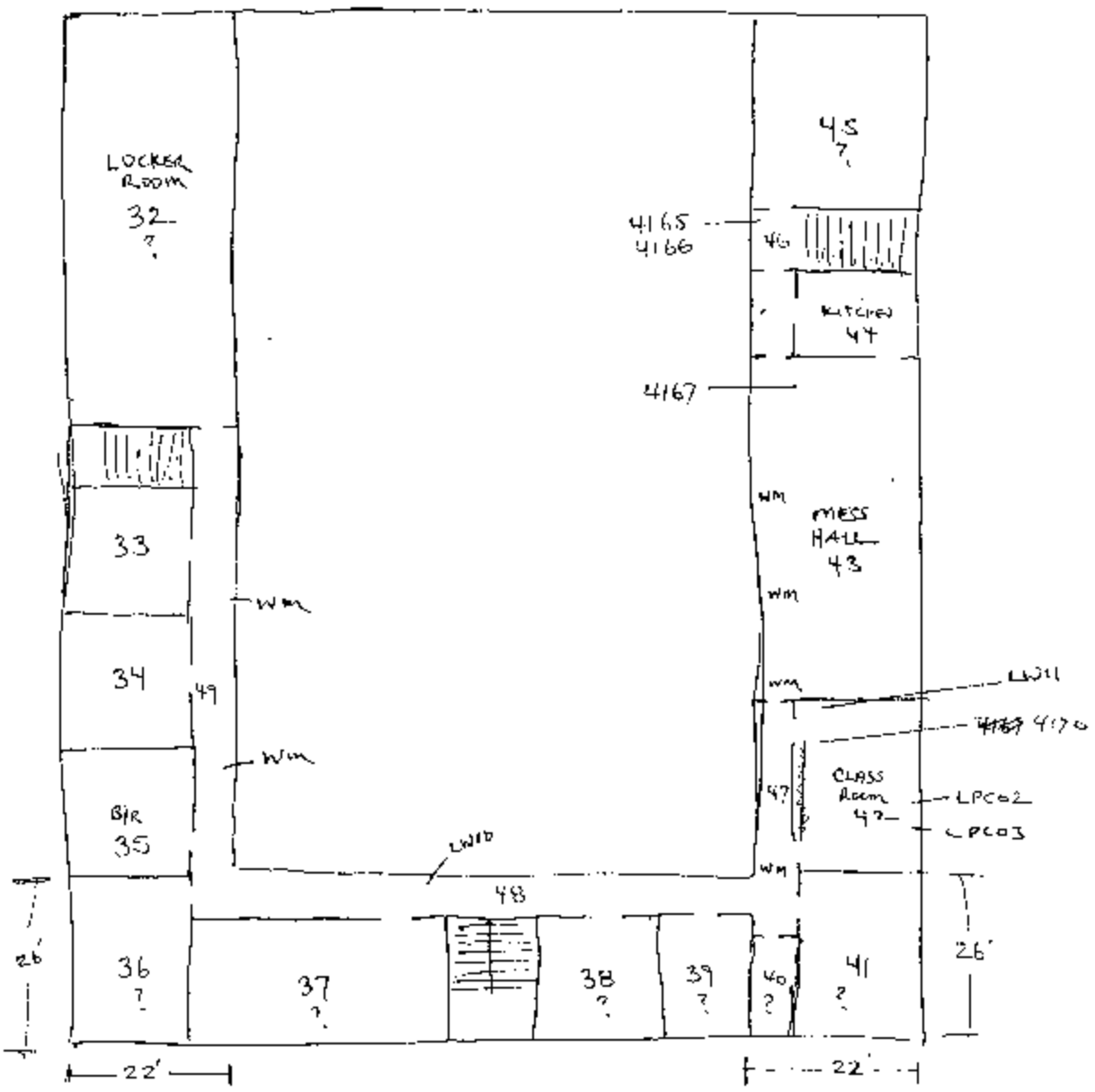
Job ____ Project No. ____ Sheet ____ of ____

Description ____ Computed by ____ Date ____

____ Checked by ____ Date ____

Reference

2ND FLOOR



FRONT

Appendix B

Personnel List

PERSONEL LIST
MELROSE ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SGT

Appendix C

Hazardous Materials List

NOT AVAILABLE

Appendix D

Analytical Results

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123990
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation Havre de Grace, Maryland 21078	**Job Location:**	120 Main Street; Melrose MA	**Date Analyzed:**	03/16/2004
		Job Number:	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0432392	0304-AB 01 A	5	5	--	--	--	15	--	--	--	--	80	Off-White	LB	
0432393	0304-AB 01 B	5	5	--	--	--	15	--	--	--	--	80	Off-White	LB	
0432394	0304-AB 02 A	65	65	--	--	--	--	--	5	--	--	30	Off-White	LB	
0432395	0304-AB 02 B	85	85	--	--	--	--	--	--	--	--	15	Off-White	LB	
0432396	0304-AB 03 A	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0432397	0304-AB 03 B	NAD	--	--	--	--	--	--	--	--	--	100	Off-White	LB	
0432398	0304-AB 04 A	NAD	--	--	--	--	--	--	--	--	--	100	Beige	LB	
0432399	0304-AB 04 B	NAD	--	--	--	--	--	--	--	--	--	100	Off-White	LB	
0432400	0304-AB 05 A	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0432401	0304-AB 05 B	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0432402	0304-AB 06 A	NAD	--	--	--	--	--	--	--	--	--	100	Gray	LB	
0432403	0304-AB 06 B	NAD	--	--	--	--	--	--	--	--	--	100	Beige	LB	
0432404	0304-AB 07 A	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0432405	0304-AB 07 B	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0432406	0304-AB 08 A	3	3	--	--	--	--	--	--	--	--	97	Off-White	LB	
0432407	0304-AB 08 B	3	3	--	--	--	--	--	--	--	--	97	Off-White	LB	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123990
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	120 Main Street; Melrose MA	**Date Analyzed:**	03/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123990
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	120 Main Street; Melrose MA	**Date Analyzed:**	3/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	26-Mar-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0432373	0304-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.04	%Pb	
0432374	0304-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.01	%Pb	
0432375	0304-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0084	%Pb	
0432376	0304-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	0.07	%Pb	
0432377	0304-LW 01	Furnace	Wipe	****	0.111	13.50	ug/ft^2	44	ug/ft^2	
0432378	0304-LW 02	Flame	Wipe	****	0.111	108.01	ug/ft^2	840	ug/ft^2	
0432379	0304-LW 03	Flame	Wipe	****	0.111	108.01	ug/ft^2	390	ug/ft^2	
0432380	0304-LW 04	Furnace	Wipe	****	0.111	2.70	ug/ft^2	19	ug/ft^2	
0432381	0304-LW 05	Furnace	Wipe	****	0.111	2.70	ug/ft^2	6.8	ug/ft^2	
0432382	0304-LW 06	Furnace	Wipe	****	0.111	13.50	ug/ft^2	42	ug/ft^2	
0432383	0304-LW 07	Furnace	Wipe	****	0.111	13.50	ug/ft^2	21	ug/ft^2	
0432384	0304-LW 08	Furnace	Wipe	****	0.111	13.50	ug/ft^2	64	ug/ft^2	
0432385	0304-LW 09	Furnace	Wipe	****	0.111	2.70	ug/ft^2	7	ug/ft^2	
0432386	0304-LW 10	Furnace	Wipe	****	0.111	2.70	ug/ft^2	19	ug/ft^2	
0432387	0304-LW 11	Furnace	Wipe	****	0.111	2.70	ug/ft^2	17	ug/ft^2	
0432388	0304-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30	ug	0.65	ug	
0432389	0304-LA 01	Flame	Air	1064	N/A	2.82	ug/m^3	< 2.8	ug/m^3	
0432390	0304-LA 02	Flame	Air	1004	N/A	2.99	ug/m^3	< 3	ug/m^3	
0432391	0304-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m^3	< 3	ug	

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123990
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	120 Main Street; Melrose MA	**Date Analyzed:**	3/16/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	26-Mar-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

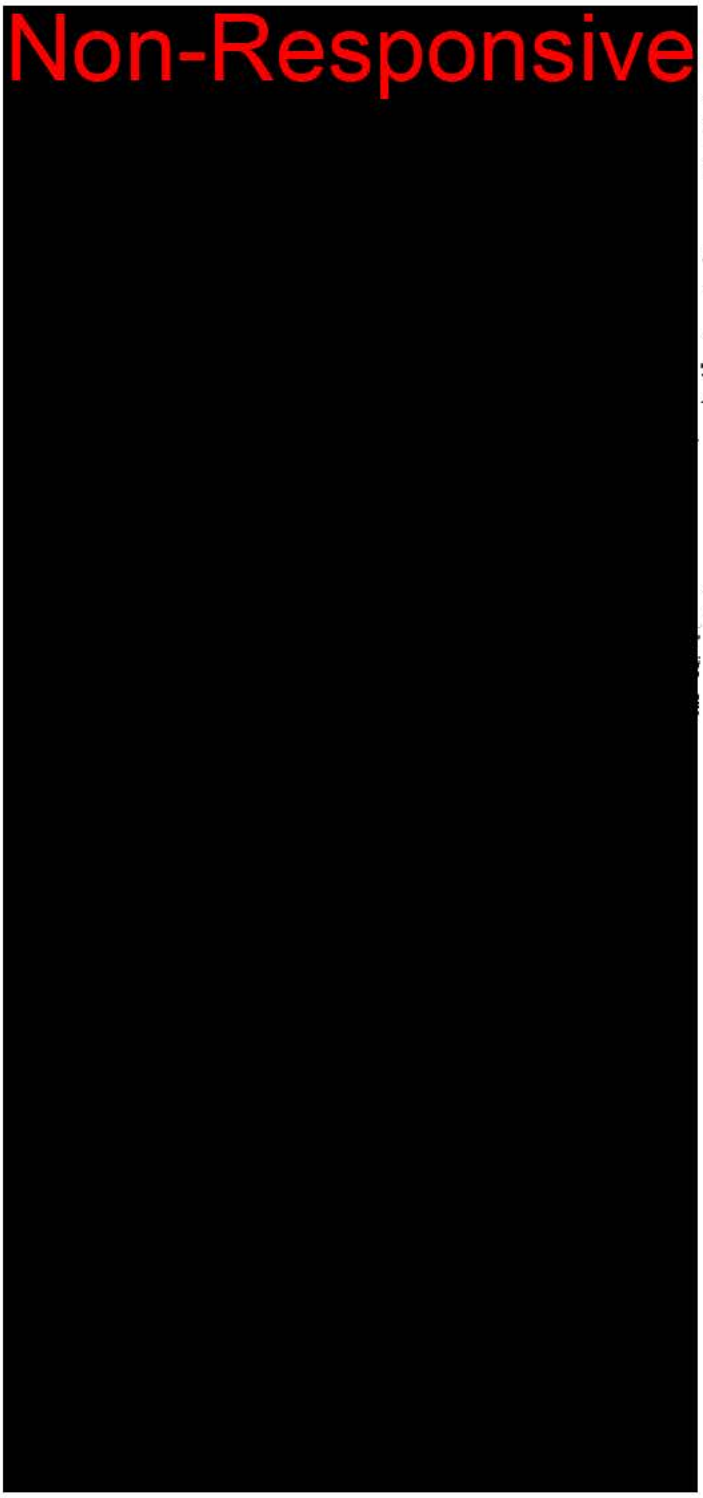
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Anal[redacted] echnical Manager: [redacted]

Non-Responsive

Appendix E

Training Certificates



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INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

April 10, 2004
Expiration Date

03518010625349
Certificate Number

[redacted]
President/Director of Training

Appendix F

Photographs

Photo 4144: Boiler Room #1 – Damaged asbestos-containing pipe insulation

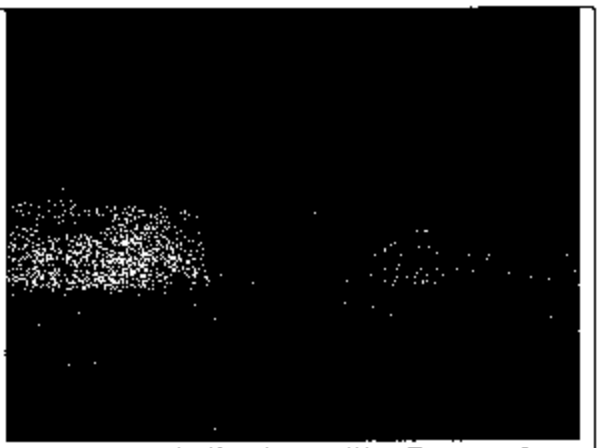

Photo 4145: Boiler Room #1 – Damaged asbestos-containing pipe insulation

Photo 4146: Boiler Room #1 – Damaged asbestos-containing pipe insulation

Photo 4148: Boiler Room #1 – Confined space (pipe chase) extending from Boiler Room #1

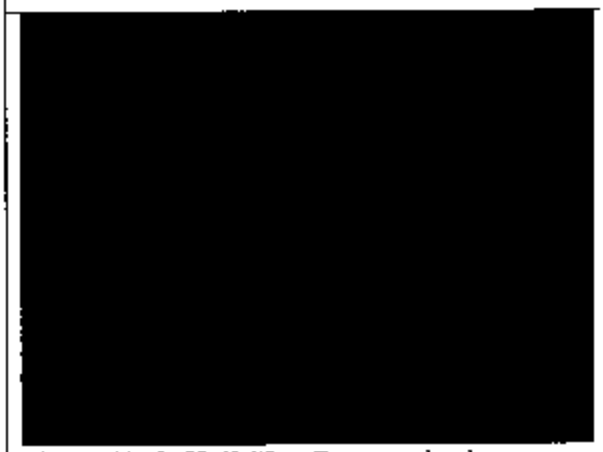

Photo 4149: Hall #2 – Damaged asbestos-containing pipe insulation

Photo 4151: Office #12 - Water damage plaster

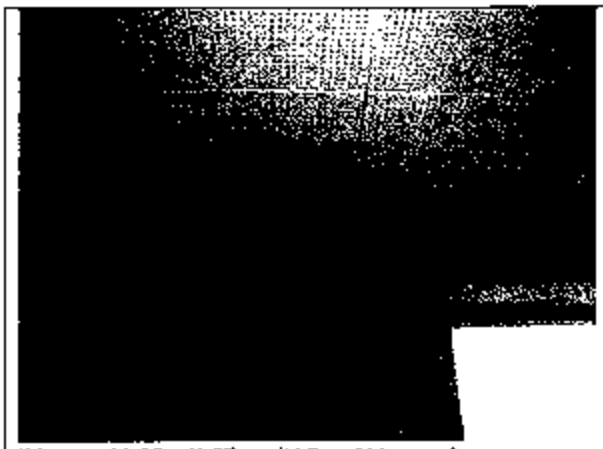

Photo 4152: Office #12 – Water damage

Photo 4154: Office #12 – Computer workstation

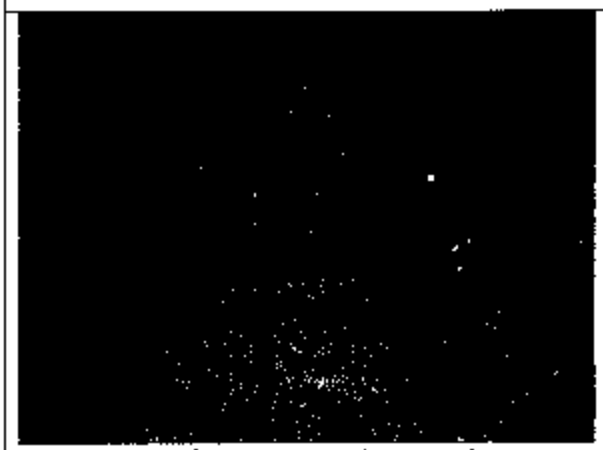

Photo 4155: Closet #16 – Damaged asbestos-containing floor tile

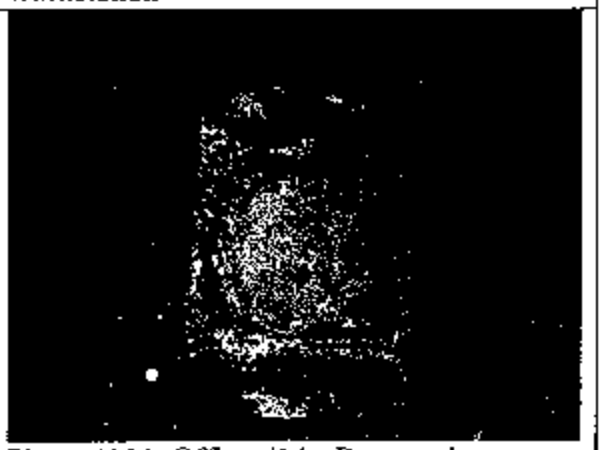

Photo 4156: Office #14 - Damaged asbestos-containing floor tile

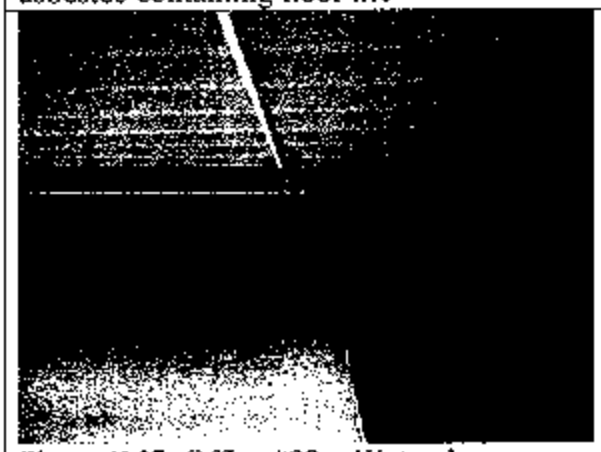

Photo 4157: Office #23 Water damage above window

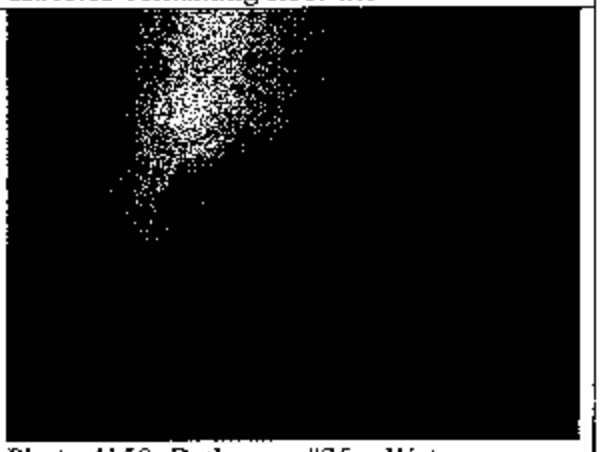

Photo 4158: Bathroom #25 – Water damaged ceiling

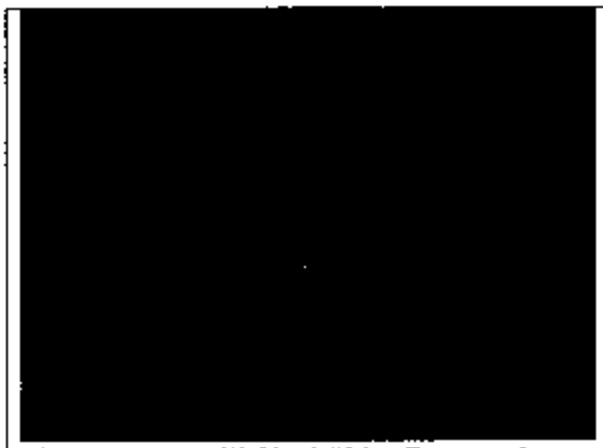

Photo 4159: Drill Shed #31 - Damaged asbestos-containing pipe insulation

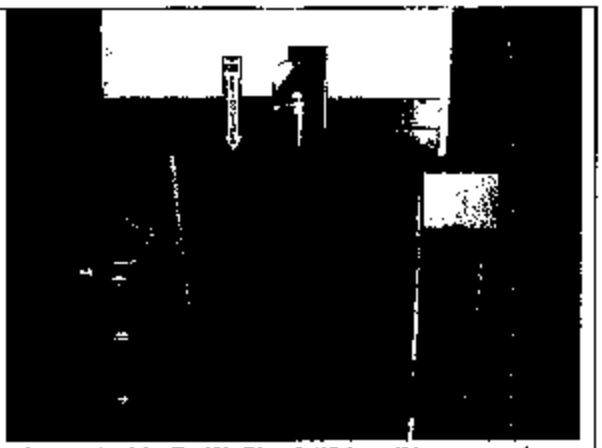

Photo 4160: Drill Shed #31 Obstructed fire extinguisher

Photo 4161: Drill Shed #31 – Unmarked and unsecured compressed gas cylinder

Photo 4162: Drill Shed #31 - Exit sign light is out

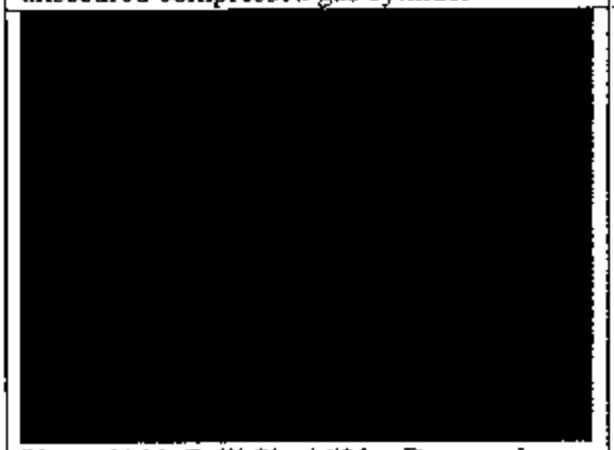

Photo 4164: Drill Shed #31 -- Damaged asbestos-containing floor tile

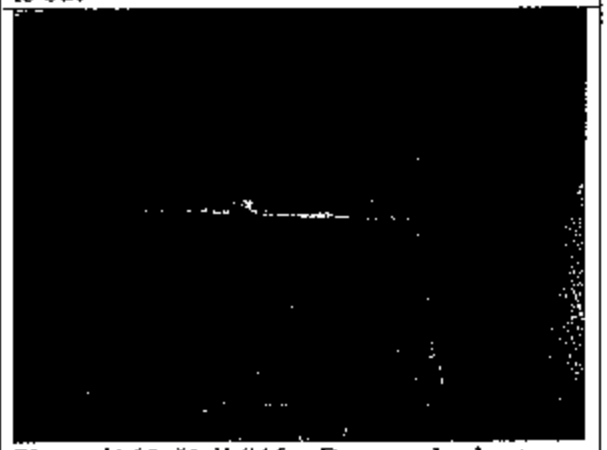

Photo 4165: Hall #46 – Damaged asbestos-containing floor tile

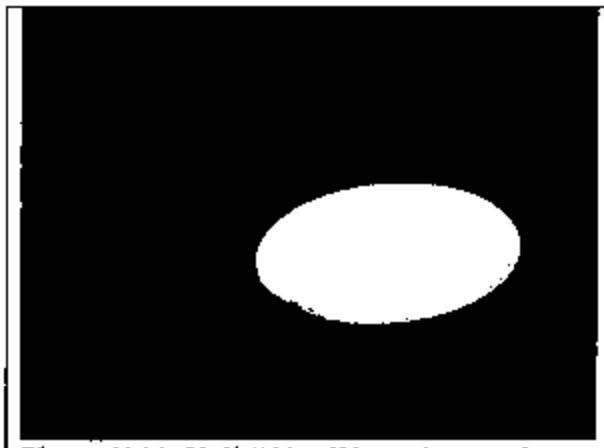

Photo 4166: Hall #46 – Water damaged ceiling

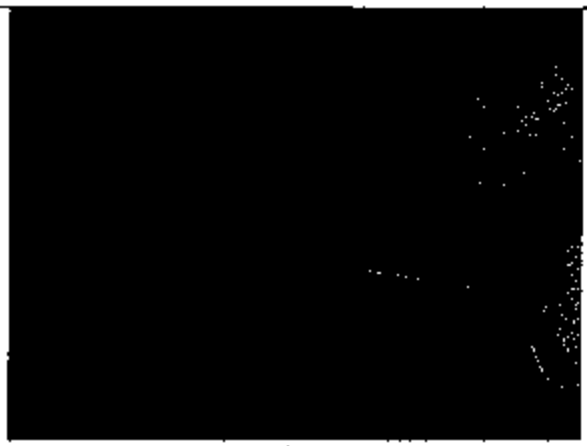

Photo 4167: Mess Hall #43 -- Water damaged ceiling

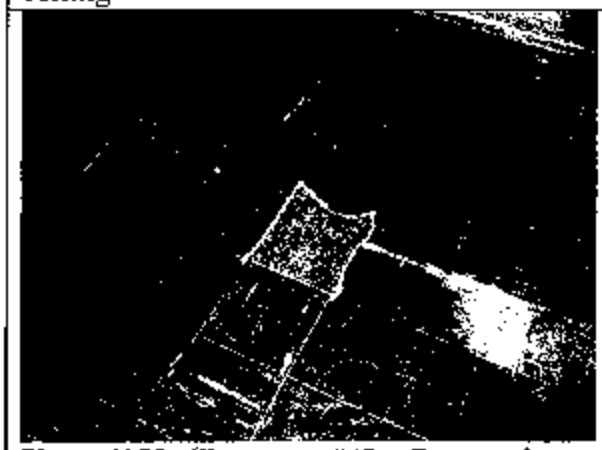

Photo 4170: Classroom #42 -- Damaged asbestos-containing floor tile

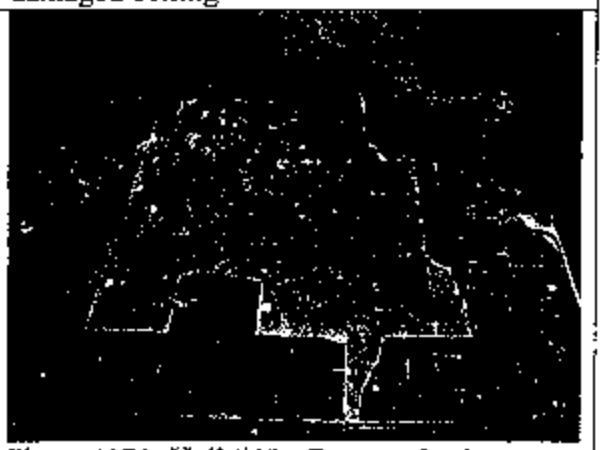

Photo 4171: Hall #49 - Damaged asbestos-containing floor tile

Photo 4172: Hall #49 - Water damaged ceiling tiles

Photo 4185: Room #26 Damaged asbestos-containing floor tile

Photo 4186: Room 5A Water damaged ceiling

Appendix G

Recommendations for Surface Lead Dust in Armories

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
120 MAIN STREET
MELROSE, MA 02176

June 17, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
120 MAIN STREET, MELROSE, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	Increase lighting in the work areas. While work is in progress, these areas must be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04).	RAC 4
Ergonomics		
Computer workstations in the Administrative Areas were observed with un-adjustable chairs, arm rests and keyboards	Ergonomic issues with regard to the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3).	RAC 3
Water Intrusion		
Water staining was observed on ceiling tiles throughout the 2nd Floor.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Personal Protective Equipment		
No hazard assessment had been conducted to determine whether personal protective equipment was required for any operations performed at the site.	The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which will necessitate the use of personal protective equipment (29 CFR 1910.132 (d)(1)).	RAC 4
Asbestos/ Lead		
Several areas throughout the facility have been posted as unsafe due to asbestos and/ or lead contamination; however some of these areas are still regularly used.	The employees must follow signage and hazard information communicated to them and not access off-limits areas (1926.1101 (k)(1)(i)).	RAC 3
Asbestos		
An asbestos Operations and Maintenance Program was present on site but re-inspection records of confirmed ACM were missing.	An Asbestos Operations and Maintenance program must contain a variety of records, including records of periodic re-inspection (29 CFR 1910.1001 (j)(2)(ii)).	RAC 4

Findings	Recommendations	Risk Assessment Code (RAC)
Lead		
Six lead wipe samples indicated elevated lead levels.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Emergency Exits		
Emergency exit signs were not visible from all areas of the facility.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
Respiratory Protection		
No written respiratory protection program was found at the site. No assessment had been conducted to determine whether respirators are required for any operations conducted at the site.	Conduct a hazard assessment of site operations to determine what types of PPE are required for each type of work (29 CFR 1910.132(d)(1).	RAC 4

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center in Melrose, Massachusetts.

URS representative, Mr. Non-Responsive, conducted the Industrial Hygiene Survey on March 25, 2013. The scope of work included an overall assessment of the facility as it relates to industrial hygiene and included a walkthrough of the facility, collection of photographs, and when required, measurements for illumination (light), area and personal air sampling, and noise mapping.

The Melrose Readiness Center is a two-story brick building, consisting of offices, classrooms, storage rooms, an Assembly Hall, kitchen, male and female latrines, supply rooms and a museum. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Moderate water staining was observed on ceiling tiles throughout the facility as a result of roof leaks. During interviews with site personnel, water intrusion was also identified in a basement crawl space/tunnel and the Boiler Room. According to interviews, the crawl space flooded, dislodging asbestos-containing pipe insulation which became distributed throughout the crawl space/tunnel and the Boiler Room. URS did not access this area during this survey since it had not been decontaminated.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in six of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress, work areas must be lighted by at least the minimum light intensities.

CARBON MONOXIDE: Carbon monoxide levels were found to be low.

LEAD: Six wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, one of the paint chip samples was found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: No accessible, damaged, friable suspect asbestos-containing materials were identified for sample collection.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. Computer workstations were assessed during the walkthrough for ergonomic issues. The computer workstations in the facility did not meet the current Occupational Safety and Health Administration (OSHA) ergonomic recommendations. The chair armrests, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Noise mapping in the Readiness Center determined that area noise levels were below the OSHA permissible exposure limit (PEL) and the Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, a kitchen, gender separate bathrooms, locker storage rooms, storage rooms, a kitchen and a Drill Hall.

The Readiness Center was found to be slightly cluttered and unorganized at the time of URS' site visit.

2.2 Chemical and Physical Agents Sampled

2.2.1 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made in the Readiness Center. Interior carbon dioxide concentrations were found to be between 540 and 734 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is human respiration. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems but is typically used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

To minimize air quality complaints, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed that the carbon dioxide concentration within an occupied workspace be maintained below 700 ppm above ambient outside levels. For example, on the day of the survey, the outside carbon dioxide level was measured at 440 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1140 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Readiness Center was measured between 0.0 ppm and 0.6 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Trak Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center, measured with the Q-Trak Plus, was 25.9%, which was within the guideline of less than 65% recommended by ASHRAE.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

The average temperature inside the Readiness Center was, 69.8 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot candles (FC) and the recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
1st Floor, Office 103, desk	Admin	81.2	50
1st Floor, Office 102, desk	Admin	79.3	50
1st Floor, Office, workstation	Admin	104.9	50
1st Floor, Office right of Lobby, workstation	Admin	115.8	50
1st Floor, Office 108, workstation	Admin	127.3	50
1st Floor, Office 109, workstation	Admin	132.2	50
Recruiter's Office, workstation	Admin	70.1	50
Recruiter's Office, workstation	Admin	68.7	50
Supply Office, desk	Admin	34.2	50
Supply Office, Commander, desk	Admin	**20.6**	50
Office 210, workstation	Admin	127.9	50
Office 210, workstation	Admin	121.7	50
Office 211, workstation	Admin	**19.9**	50
Office 212, workstation	Admin	**34.2**	50
Office 201, workstation	Admin	**45.4**	50
Office 202, workstation	Admin	**41.9**	50
Office 203, workstation	Admin	104.5	50
Office 204, workstation	Admin	120.5	50
Office 204, workstation	Admin	119.8	50
Office 205, workstation	Admin	**49.8**	50
Office 205, workstation	Admin	83.3	50
Conference Room, table	Admin	52.8	50
Kitchen, table	Break Room	36.1	10

*Note: 2 light fixtures in the offices identified were not operational at the time of the survey

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in six of the office/administrative locations.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
1st Floor, Office 103, top shelf, behind left desk	Melrose RC Wipe-01	0.108	<110	200
1st Floor, Office 112, unit room, top of file cabinet	Melrose RC Wipe-02	0.108	<110	200
2nd Floor, Office 212, window sill	Melrose RC Wipe-03	0.108	<110	200
2nd Floor, Room 207, Museum, window sill	Melrose RC Wipe-04	0.108	140	200
2nd Floor, Office 210, window sill	Melrose RC Wipe-05	0.108	**490**	200
Drill Hall, floor, right of wooden bench	Melrose RC Wipe-06	0.108	**280**	200
Bay Area, off Drill Hall, top of flammable cabinet	Melrose RC Wipe-07	0.108	**320**	200
Supply Room, top of kitchen supply shelf	Melrose RC Wipe-08	0.108	**2400**	200
Communication Supply, bottom shelf	Melrose RC Wipe-09	0.108	**3400**	200
2nd Floor, latrine, window sill	Melrose RC Wipe-10	0.108	**410**	200

Six surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62. No

samples were collected in the former firing range since access to that building area was restricted.

Three paint chip samples were collected from areas of peeling paint in the first floor and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Gray paint, 1st Floor, Room 112	0.22	0.5
White paint, Conference Room, window sill	**0.71**	0.5
Tan paint, 1st Floor, Storage hall, air vent	0.017	0.5

On the day of the survey, one of the paint chip samples was found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

No damaged, friable suspect asbestos-containing materials were identified for sample collection.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans, window air conditioning units) within the majority of rooms, and main negative draw fans in the Drill Hall.

2.4 Noise Measurements

Noise dosimetry was conducted within the administrative office area. Noise exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-4 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-4
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Office 103	Administrative	382	64.8	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included safety glasses, ear plugs and nitrile gloves.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility.

3.2 Hearing Conservation

A written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection. OSHA requires that a hazard assessment be conducted to determine whether respiratory protection is required for any site operations.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was identified on site, however it did not include re-inspection records.

3.7 Safety

Several spaces in the Readiness Center were observed to be posted as lead and/or asbestos-contaminated, including Room 111, Room 209, former Indoor Firing Range and the Boiler Room. According to interviews with site personnel, the former Indoor Firing Range is still accessed on a regular basis.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program, 15 August 2003

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date, 4 October 2011

National Guard Pamphlet 420-15

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

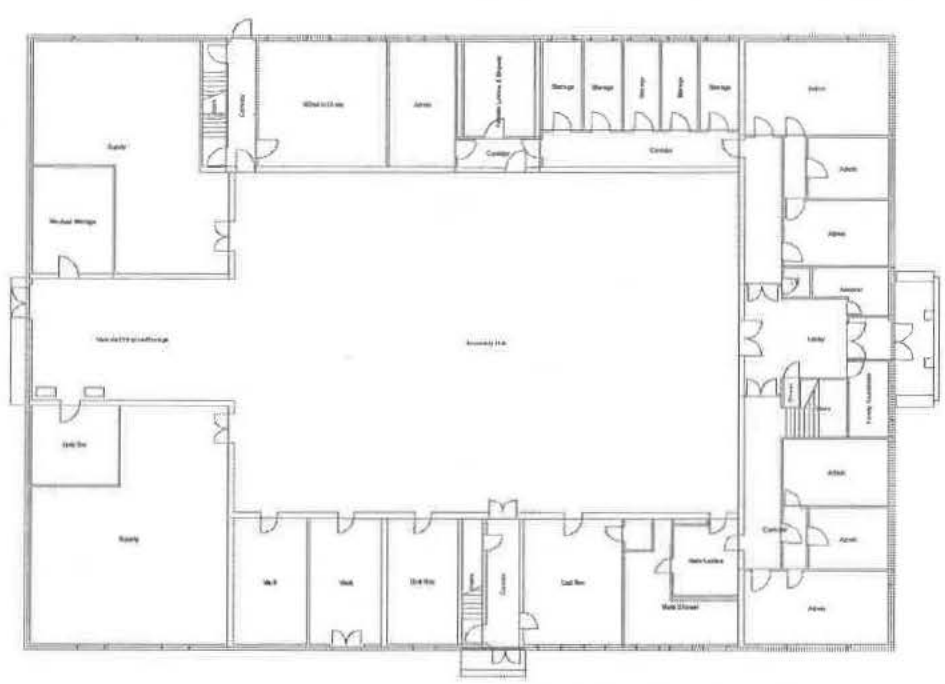
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

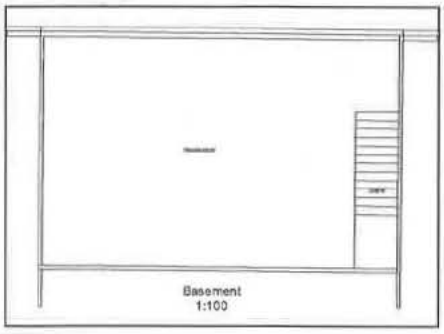
APPENDIX A

SHOP DRAWING

MELROSE - 25B70
First Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE





0 5 10 20 30 40 50
Feet

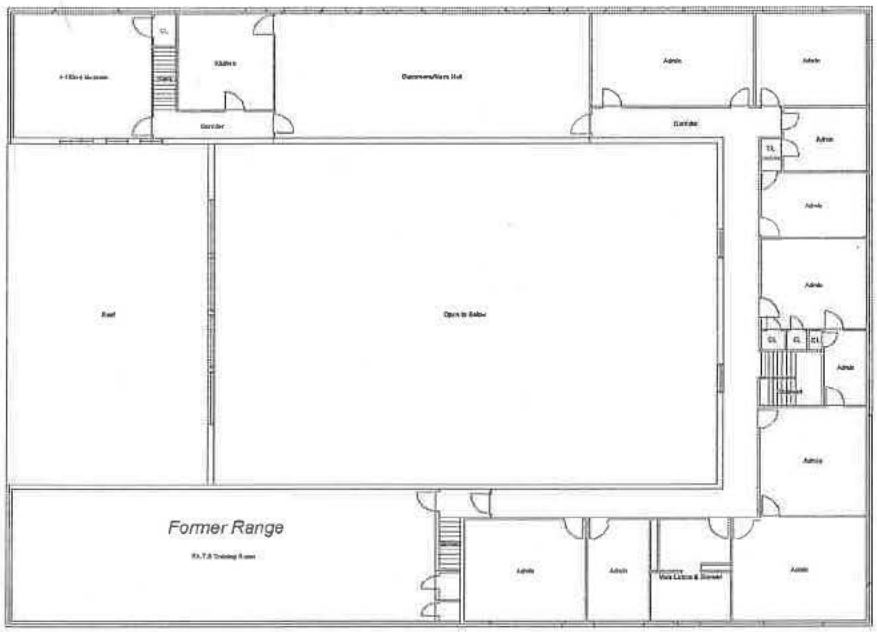
0 5 10 20
Meters

N

12 March 2012

MELROSE - 25B70
Second Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

The information on this map is for planning purposes only.
This information is not adequate for legal boundary definition,
regulatory interpretation, or parcel-level analysis.

N

12 March 2012

APPENDIX B

PERSONNEL LIST

1-182 IN FTSF
120 Main ST, Melrose, MA 02176

MAJ
CPT
CW2
MSG
1SG
SFC
SFC
SFC
SSG
SSG

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515479
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	120 Main Street, Melrose, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Melrose RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/5/2013 **Report Date:** 4/5/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13049864	Melrose RC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13049865	Melrose RC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13049866	Melrose RC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13049867	Melrose RC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft²	15	140	ug/ft²	
13049868	Melrose RC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft²	53	490	ug/ft²	
13049869	Melrose RC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft²	30	280	ug/ft²	
13049870	Melrose RC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft²	35	320	ug/ft²	
13049871	Melrose RC Wipe-08	Flame	Wipe	****	0.108	110	ug/ft²	260	2400	ug/ft²	
13049872	Melrose RC Wipe-09	Flame	Wipe	****	0.108	110	ug/ft²	360	3400	ug/ft²	
13049873	Melrose RC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft²	44	410	ug/ft²	
13049874	Melrose RC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13049875	Melrose RC LP-01	Flame	Paint Chip	****	N/A	0.0067	%Pb		0.22	%Pb	
13049876	Melrose RC LP-02	Flame	Paint Chip	****	N/A	0.0098	%Pb		0.71	%Pb	
13049877	Melrose RC LP-03	Flame	Paint Chip	****	N/A	0.011	%Pb		0.017	%Pb	

AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515479
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	120 Main Street, Melrose, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Melrose RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/5/2013 **Report Date:** 4/5/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: Non-Responsive

Technical Mana: Non-Responsive

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AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **515479**

Pg 1 of 2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA ARNG
2. Job Location: 120 Main st, Melrose, MA
3. Job #: Melrose RC PO #: [redacted]
4. Contact Pers[redacted]
5. Submitted By[redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ______ ☐ 24 Hours Time Due: ______ Comments: ______	☐ Immediate ☐ 3 Day ☐ Next Day ☒ 5 Day + ☐ 2 Day Date Due: 4/8/13 ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Inc[redacted] with Report [redacted] urs.com ☐ Fa[redacted] us.army.mil ☐ Ve[redacted] us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ______ (QTY)
- ☐ Fiberglass ______ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ______ (QTY)
- ☐ NIOSH 7402 ______ (QTY)
- ☐ Other (specify ______) ______ (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate ______ (QTY)
- ☐ EPA Point Count ______ (QTY)
- ☐ NY State Friable 198.1 ______ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ______ (QTY)
- ☐ Other (specify ______) ______ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield ______ (QTY)
- ☐ NY State PLM/TEM ______ (QTY)
- ☐ Residual Ash ______ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ______ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 ______ (QTY)
- ☐ Quan. (s/area) Dust D6480-99 ______ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ______ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ______ (QTY)
- ☐ EPA 100.1 ______ (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ______ °C)

Metals Analysis
- ☒ Pb Paint Chip ≠ 3 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 11 (QTY)
- ☐ Pb Air ______ (QTY)
- ☐ Pb Soil/Solid ______ (QTY)
- ☐ Pb TCLP ______ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ______) ______ (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples: ______
Collection Media ______
- ☐ Spore-Trap ______ (QTY) ☐ Surface Vacuum Dust ______ (QTY)
- ☐ Surface Swab ______ (QTY) ☐ Culturable ID Genus (Media ______) ______ (QTY)
- ☐ Surface Tape ______ (QTY) ☐ Culturable ID Species (Media ______) ______ (QTY)
- ☐ Other (Specify ______) ______ (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Melrose RC wipe 01	1st d min	3/25/13		100cm²				X				X				
Melrose RC wipe 02	↓	↓		↓				X				X				
Melrose RC wipe 03								X				X				
Melrose RC wipe 04								X				X				
Melrose RC wipe 05	↓							X				X				
Melrose RC wipe 06	maintenance							X				X				
Melrose RC wipe 07	↓							X				X				
Melrose RC wipe 08								X				X				
Melrose RC wipe 09								X				X				
Melrose RC wipe 10	↓							X				X				
Melrose RC wipe FB	Field Blank			↓				X				X				
Melrose RC LP 01	dark gray ~ (wall 2	↓						X			X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 4 / 1 / 13 0845 Via: FEDEX By (Prin[redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ______ Sign: ______
3. Results Reported To: ______ Via: ______ Date: ____ / ____ / ____ Time: ______ Initials: ______
4. Comments: ~~FTI~~ 7940 6954 8971

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2

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Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 515479 P8262

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: MA IARNG
2. Job Location: 120 main st, Melrose, MA
3. Job #: Melrose RC PO #: W912K6-09-A-0003
4. Contact Pe[redacted] Non-Responsive
5. Submitted [redacted] Non-Responsive

Reporting Information (Results will be provi[redacted])

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	[redacted] Non-Responsive
❑ 24 Hours Time Due:	❑ Next Day X 5 Day +	[redacted] Non-Responsive
Comments:	❑ 2 Day Date Due:	❑ Fax: [redacted]
	❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	❑ Ver[redacted]

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ❑ NIOSH 7400 (QTY)
- ❑ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ❑ AHERA (QTY)
- ❑ NIOSH 7402 (QTY)
- ❑ Other (specify) (QTY)

PLM Bulk
- ❑ EPA 600 – Visual Estimate (QTY)
- ❑ EPA Point Count (QTY)
- ❑ NY State Friable 198.1 (QTY)
- ❑ Grav. Reduction ELAP 198.6 (QTY)
- ❑ Other (specify) (QTY)

MISC
- ❑ Vermiculite
- ❑ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ❑ ELAP 198.4/Chatfield (QTY)
- ❑ NY State PLM/TEM (QTY)
- ❑ Residual Ash (QTY)

TEM Dust
- ❑ Qual. (pres/abs) Vacuum/Dust (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 (QTY)
- ❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ❑ Qual. (pres/abs) (QTY)
- ❑ ELAP 198.2/EPA 100.2 (QTY)
- ❑ EPA 100.1 (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- X Pb Paint Chip 3 (QTY)
- X Pb Dust Wipe (wipe type ghost) 11 (QTY)
- ❑ Pb Air (QTY)
- ❑ Pb Soil/Solid (QTY)
- ❑ Pb TCLP (QTY)
- ❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ❑ Spore-Trap (QTY)
- ❑ Surface Swab (QTY)
- ❑ Surface Tape (QTY)
- ❑ Other (Specify) (QTY)
- ❑ Surface Vacuum Dust (QTY)
- ❑ Culturable ID Genus (Media) (QTY)
- ❑ Culturable ID Species (Media) (QTY)

SAMPLE INFORMATION					ANALYSIS							MATRIX						CLIENT CONTACT
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WIPE AND OTHER	SPORE TRAP	TAPE	SWAB	(LABORATORY STAFF ONLY)
Melrose RC LP02	white - loaf in window	3/25/13						X			X						Date/Time: Contact: By:
Melrose RC LP03	tan - hall vent	3/25/13						X			X						
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Melrose RC	120 Main St., Melrose, MA	39743799

Photo No.	Date:
1	3/25/13

Description:

Water staining on ceiling tiles throughout second floor.

Photo No.	Date:
2	3/25/13

Description:

Water staining on ceiling tiles throughout second floor.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Melrose RC	120 Main St., Melrose, MA	39743799

Photo No.	Date:
3	3/25/13

Description:

Hallway with no emergency exit sign visible.

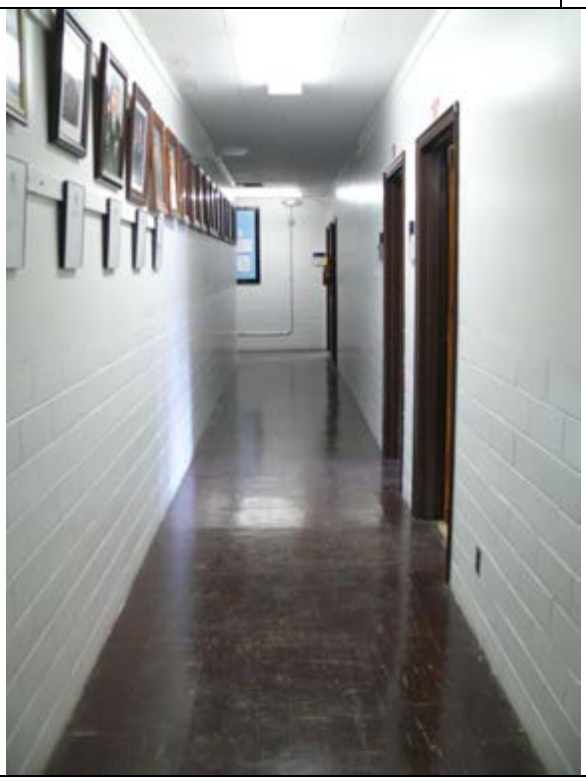

Photo No.	Date:
4	3/25/13

Description:

Typical office setting and ergonomics.

P:\Project\National Guard Bureau\39743798 IH Services ME & MA\39743799 - MA Sites\Reports\Melrose RC\Melrose RC Photo Log docx

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
MILFORD READINESS CENTER
24 PEARL STREET
MILFORD, MASSACHUSETTS

Non-Responsive
Office Manager

Non-Responsive
Project Manager

October 2005
PN: 39741508

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Section Page

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the safe, former firing range and drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the safe, former firing range and drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Peeling white lead-based paint was present in Drill Shed.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025 (h)(1))	RAC 4
Asbestos		
A puncture hole was found in asbestos-containing pipe fitting insulation leading to the boiler.	Repair the exposed asbestos pipe fitting. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was available, however elements of this plan including labeling and training were not implemented.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3

FINDINGS AND RECOMMENDATIONS (Continued)

Findings	Recommendation	Risk Assessment Code
Hazard Communication		
No site specific hazard communication plan was available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Emergency Exit Route Safety		
An emergency exit was obstructed by equipment being stored in the hallway.	Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route (OSHA 29 CFR 1910.37(a)(3)).	RAC 2
Two emergency lights were found damaged and inoperable.	All emergency lights must be in good operating condition (OSHA 29 CFR 1910.37(a)(4))	RAC 2
Fire Safety		
A few fire extinguishers were found to be inoperable.	Fire extinguishers must be in proper working order or taken out of service (OSHA 29 CFR 1910.156).	RAC 2
Thermal Protection		
Accessible active steam pipes were not insulated creating a burn hazard.	Cover all accessible pipes (within seven feet of floor or working surface) carrying steam with heat insulating material or other guarding (OSHA 29 CFR1910.262(c)(9)).	RAC 3

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 24 Pearl Street in Milford, Massachusetts 01757. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 25, 2004, Mr. Non-Responsive, an industrial hygienist with URS, conducted a site visit to the Readiness Center in Milford, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive of the Commonwealth of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chair armrests were in a fixed position and keyboards could not be adjusted in room #15 (Photo # 4013) and office # 16 (Photo # 4038). If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

Water marks and damage were observed on the ceilings and/or walls of room # 3 (Photo # 4006-07); room # 2 (Photo # 4009-10); room # 15 (Photos # 4012 & 4014); office #21 (Photo # 4019); room # 29 (Photos # 4025-26) and office #23 (Photo # 4016). The main area of concern is in the mess hall (room # 3) where mold growth was observed.

There was a fire extinguisher in hallway # 25 that had been discharged (Photo # 4028).

The emergency exit in classroom # 15 was obstructed at the time of this survey (Photo # 4011).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 15.7 – 17.2% with an average of 16.2%. These readings were below the recommended range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 441 to 455 parts per million (ppm), with an average of 446 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and

motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE (Standard 62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Since the average interior carbon dioxide reading was below 700 ppm an exterior reading was not collected.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. Carbon monoxide concentrations ranged from 0 to 1 ppm throughout the survey period. The measured levels were below the ASHRAE guideline for indoor environments (62.1-2004). Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI /IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Classroom # 15	Administrative Duties	356 / 33.1	500 / 50
Office # 16	Administrative Duties	242 / 22.5	500 / 50
Office # 21	Administrative Duties	232 / 21.6	500 / 50
Office # 22	Administrative Duties	309 / 28.7	500 / 50
Office # 23	Administrative Duties	98 / 9.1	500 /50
Hallway # 18	Accessway	177 / 16.4	30 / 3

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Hallway # 9	Accessway	120 / 11.1	30 / 3
Hallway # 25	Accessway	136 / 12.6	30 / 3

On the day of the survey the illuminance in the administrative area was inadequate in the office.

2.2.5 Lead

Two paint chips were collected where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. The samples were found to contain lead in a concentration below the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Area 9A	0225-LPC01	0.01	0.025
Room # 7	0225-LPC02	0.01	0.17

The analytical report from AMA is contained in Appendix D

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Recommended Surface Contamination Level ($\mu g/ft^2$)
Admin #15 (Table Top)	0225-LW11	0.111	56	200
Admin #16 (Top of Bookcase)	0225-LW12	0.111	24	200
Admin #18 (Hallway Floor)	0225-LW13	0.111	41	200

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Recommended Surface Contamination Level ($\mu g/ft^2$)
Admin #23 (File Cabinet)	0225-LW14	0.111	93	200
Admin #21 (Safe)	0225-LW15	0.111	410	200
Admin #20 (Stairway)	0225-LW16	0.111	40	200
Blank	0225-LWBlank	N/A	2.2	200

2.2.6 Asbestos

ATC Associates of Woburn, Massachusetts conducted an asbestos survey at this facility in September of 2000. Water damaged asbestos-containing 9"x9" floor tile was found in office # 23 (Photo # 4015), office # 21 (Photo # 4018) and office #22 (Photo # 4017).

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in all of the offices. URS recommends increasing lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

ASBESTOS: The identified water-damaged asbestos-containing floor tile needs to be removed by a properly trained licensed technician.

FIRE SAFETY: The obstructed emergency exit should to be cleared of all obstructions and maintained in a clear and unobstructed state at all times. All fire extinguishers need to be fully charged at all times or taken out of service.

MOLD: The water stains and damage on the ceilings and/or walls could lead to larger mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Recommended Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Floor – Rear	0225-LW01	0.111	510	200
Former Firing Range-Floor – Center	0225-LW02	0.111	430	200
Former Firing Range-Floor – Front	0225-LW03	0.111	420	200
Former Firing Range-Top of a Locker	0225-LW04	0.111	3,800	200
Former Firing Range-Top of a Light Guard	0225-LW05	0.111	1,900	200
Blank	0225-LWBlank	N/A	2.2	200

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Former Firing Range	0225-LA01	864	<3.5	50.0
Blank	0225-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: All five surface wipe samples collected within the former firing range were found to contain lead dust levels which exceed the maximum limit set by the National Guard Bureau. URS recommends that an appropriately licensed lead contractor clean the former firing range. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 9,680 square foot area used for assembling personnel and storing equipment. The walls are constructed of brick with a wood floor.

There is damage to the plaster walls that are coated with lead-based paint (Photos # 4020 & 4022).

The steam pipes from the heating system are not insulated (Photo # 4021), making them very hot and creating a burn hazard.

A fire extinguisher was found expelled (Photo # 4023).

Two of the five emergency lights were severely damaged and inoperable (Photo # 4024).

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels Of Lead Dust Found In The Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Recommended Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Stage Floor	0225-LW06	0.111	520	200
Drill Hall – Floor – Rear	0225-LW07	0.111	38	200
Drill Hall – Floor – Center	0225-LW08	0.111	41	200
Drill Hall – Floor – Front	0225-LW09	0.111	44	200
Drill Hall – Top of a Refrigerator	0225-LW10	0.111	13	200
Blank	0225-LWBlank	N/A	2.2	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Drill Hall	0225-LA02	840	<3.6	50.0
Blank	0225-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

One paint chip was collected where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration above the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 4-3 below shows the results of the lead paint testing.

Table 4-3
Level of Lead in Paint Found in the Drill Hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Drill Hall	0225-LPC06	0.01	0.97

The analytical report from AMA is contained in Appendix D.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: One surface wipe sample collected in this area, was found to contain lead above the 200 microgram per square foot limit set by the National Guard Bureau (See Appendix F). This area should be cleaned by personnel trained in accordance with the OSHA Lead Standards.

Peeling lead covering paint was observed on the plaster wall. Paint in these areas should be stabilized and made intact by properly trained personnel.

FIRE SAFETY: All fire extinguishers need to be fully charged at all times or taken out of service.

EMERGENCY EXITS: Safeguards designed to protect employees must be n proper working order at all times.

STEAM PIPES: All pipes carrying steam or hot water when exposed to contact and located within seven feet of the floor or working platform shall be covered with a heat-insulating material or otherwise properly guarded.

5.0 BOILER ROOM / BASEMENT AREA

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

Paint chips were collected in three areas where paint was peeling and sent to AMA for analysis. All three samples were found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

TABLE 5-1
LEVELS OF LEAD IN PAINT FOUND IN THE BOILER ROOM

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 10	0225-LPC03	0.01	<0.0098
Boiler Room # 10	0225-LPC04	0.01	0.27
Boiler Room # 10	0225-LPC05	0.01	0.013

The analytical report from AMA is contained in Appendix D.

5.2.2 Asbestos

There is a puncture hole in the asbestos-containing pipe fitting going into the boiler that was exposing the asbestos (Photo # 4005). The puncture hole should be repaired by a properly trained, licensed technician.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

LEAD: The three paint chips collected in this area were found to contain lead levels within the allowable limits and require no further testing at this time.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

A safety program was found regarding confined spaces in the units standard operating procedures manual (SOP), under tab B. No training records were found on site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is likely not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is likely not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

A safety program was found regarding personal protective equipment in the units standard operating procedures manual (SOP), under tab B. No training records were found on site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 55-2004: Thermal Environmental Conditions for Human Occupancy

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration
Standard for General Industry: 29 CFR 1910

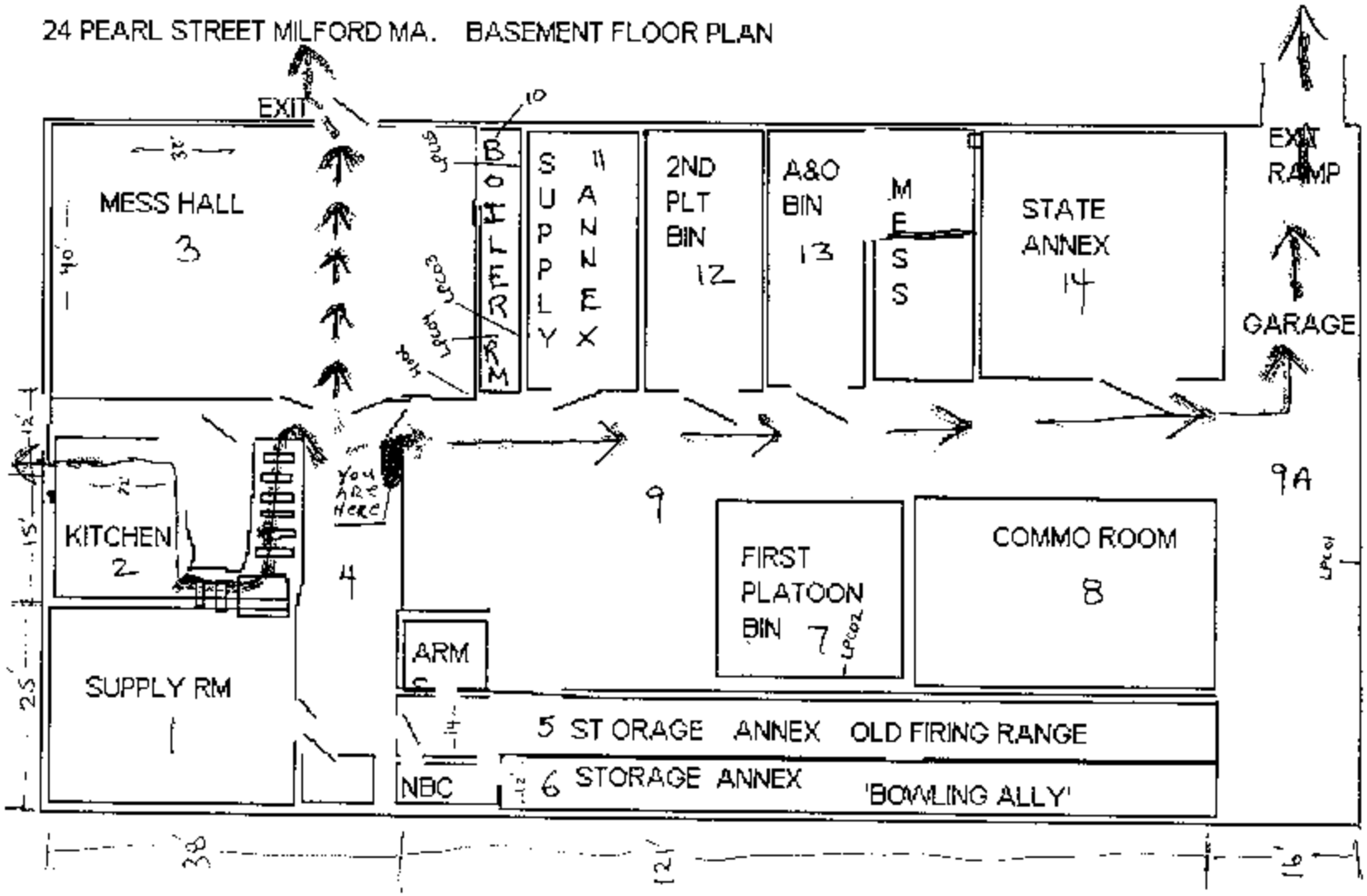
BEST AVAILABLE COPY

APPENDIX A

SHOP DRAWING

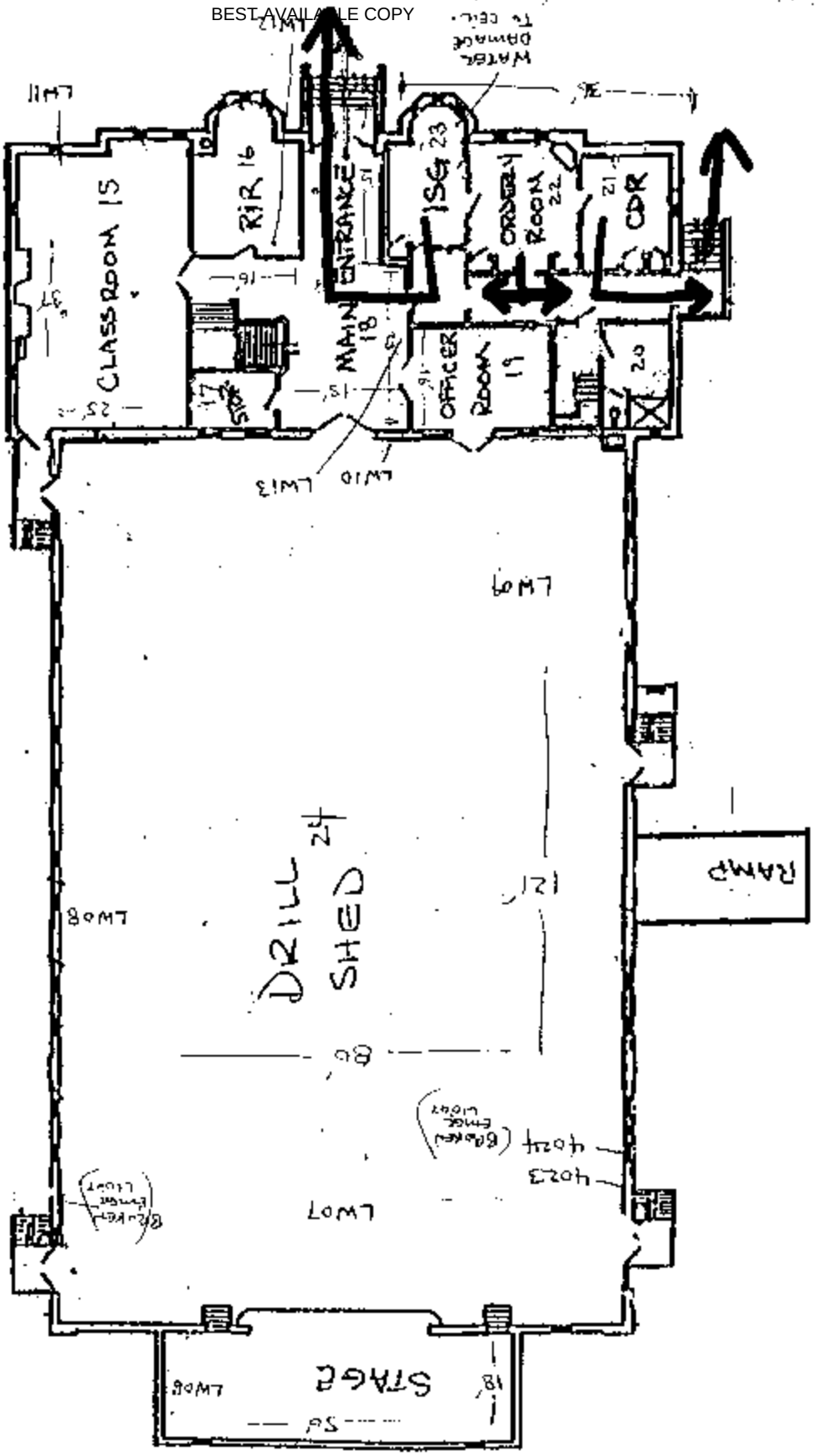
EVACUATION PLAN

MILFORD, MA

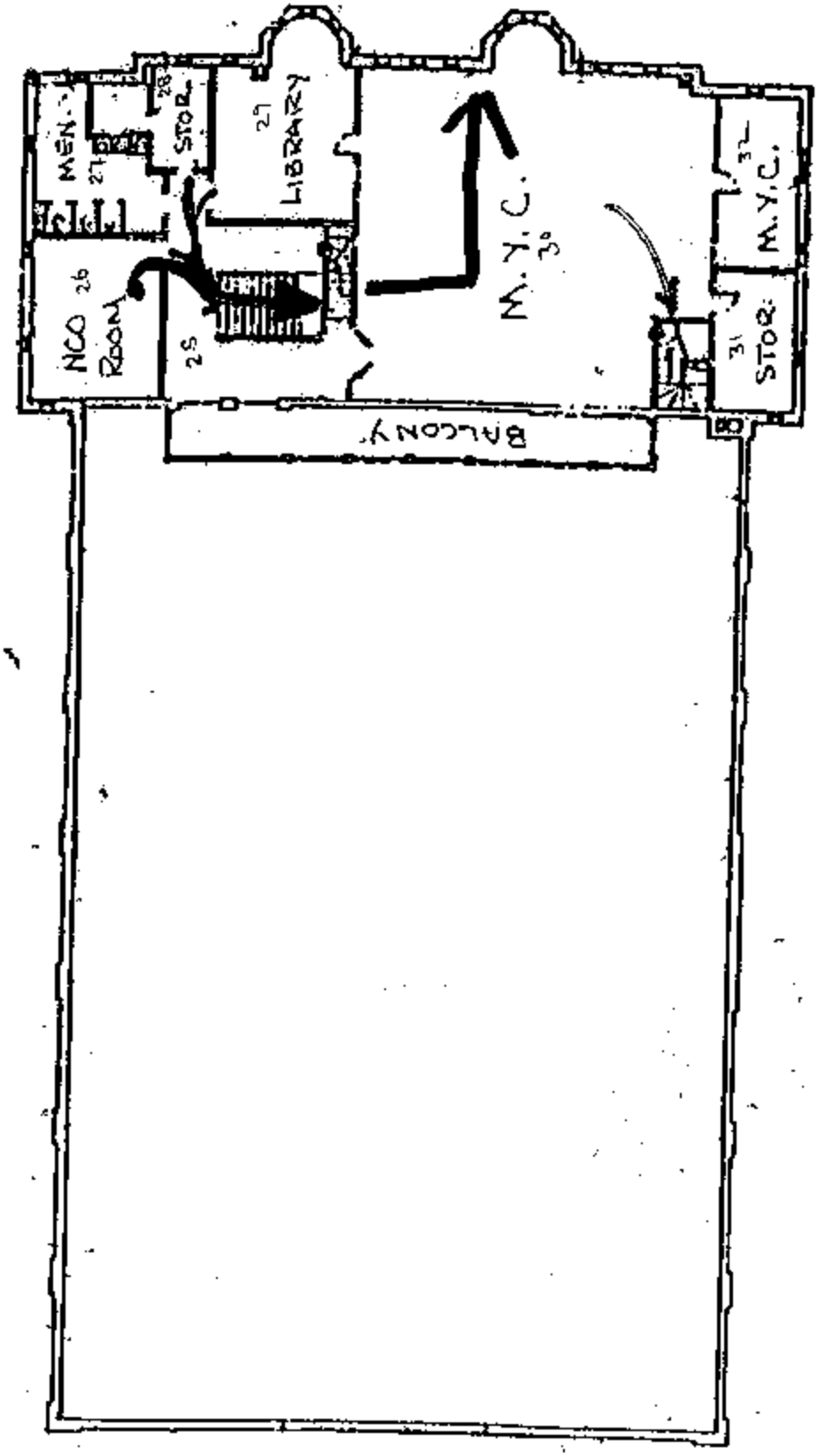


MILFORD, MA

1ST FLOOR EVACUATION PLAN



MILFORD, MA



2ND FLOOR EVACUATION PLAN

APPENDIX B

PERSONNEL LIST

PERSONEL LIST
MILFORD ARMORY

Non-Responsive	Rank
	SFC
	SSG
	SGT
	CIV

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123986
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	24 Pearl Street; Milford, MA	**Date Analyzed:**	03/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-Mar-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0432277	0225-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.025	%Pb	
0432278	0225-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.17	%Pb	
0432279	0225-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0098	%Pb	
0432280	0225-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	0.27	%Pb	
0432281	0225-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.013	%Pb	
0432282	0225-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.97	%Pb	
0432283	0225-LW 01	Flame	Wipe	****	0.111	108.01	ug/ft²	510	ug/ft²	
0432284	0225-LW 02	Flame	Wipe	****	0.111	108.01	ug/ft²	430	ug/ft²	
0432285	0225-LW 03	Flame	Wipe	****	0.111	108.01	ug/ft²	420	ug/ft²	
0432286	0225-LW 04	Flame	Wipe	****	0.111	108.01	ug/ft²	3800	ug/ft²	
0432287	0225-LW 05	Flame	Wipe	****	0.111	108.01	ug/ft²	1900	ug/ft²	
0432288	0225-LW 06	Flame	Wipe	****	0.111	108.01	ug/ft²	520	ug/ft²	
0432289	0225-LW 07	Furnace	Wipe	****	0.111	6.75	ug/ft²	38	ug/ft²	
0432290	0225-LW 08	Furnace	Wipe	****	0.111	6.75	ug/ft²	41	ug/ft²	
0432291	0225-LW 09	Furnace	Wipe	****	0.111	13.50	ug/ft²	44	ug/ft²	
0432292	0225-LW 10	Furnace	Wipe	****	0.111	2.70	ug/ft²	13	ug/ft²	
0432293	0225-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30	ug	2.2	ug	
0432294	0225-LA 01	Flame	Air	864	N/A	3.47	ug/m³	< 3.5	ug/m³	
0432295	0225-LA 02	Flame	Air	840	N/A	3.57	ug/m³	< 3.6	ug/m³	
0432296	0225-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	< 3	ug	

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123986
Address:	301-1H Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	24 Pearl Street; Milford, MA	**Date Analyzed:**	03/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-Mar-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive

cal Manager: [redacted]

M.lford MA

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARMORY	**Chain Of Custody:**	140921
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Submitted:**	6/15/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	6/20/2005 **Report Date:** 20-Jun-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

Page 1 of 1

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Final Result	Comments
0545792	0225-LW11	Furnace	Wipe	****	0.111	13.50 ug/ft²	56 ug/ft²	
0545793	0225-LW12	Furnace	Wipe	****	0.111	2.70 ug/ft²	24 ug/ft²	
0545794	0225-LW13	Furnace	Wipe	****	0.111	13.50 ug/ft²	41 ug/ft²	
0545795	0225-LW14	Furnace	Wipe	****	0.111	2.70 ug/ft²	93 ug/ft²	
0545796	0225-LW15	Furnace	Wipe	****	0.111	67.51 ug/ft²	410 ug/ft²	
0545797	0225-LW16	Furnace	Wipe	****	0.111	13.50 ug/ft²	40 ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable   mg/Kg = parts per million (ppm) by weight   mg/L = parts per million (ppm)
%Pb = percent lead by weight   ug = micrograms   ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted]ical Manager: [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory

APPENDIX E

TRAINING CERTIFICATES

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

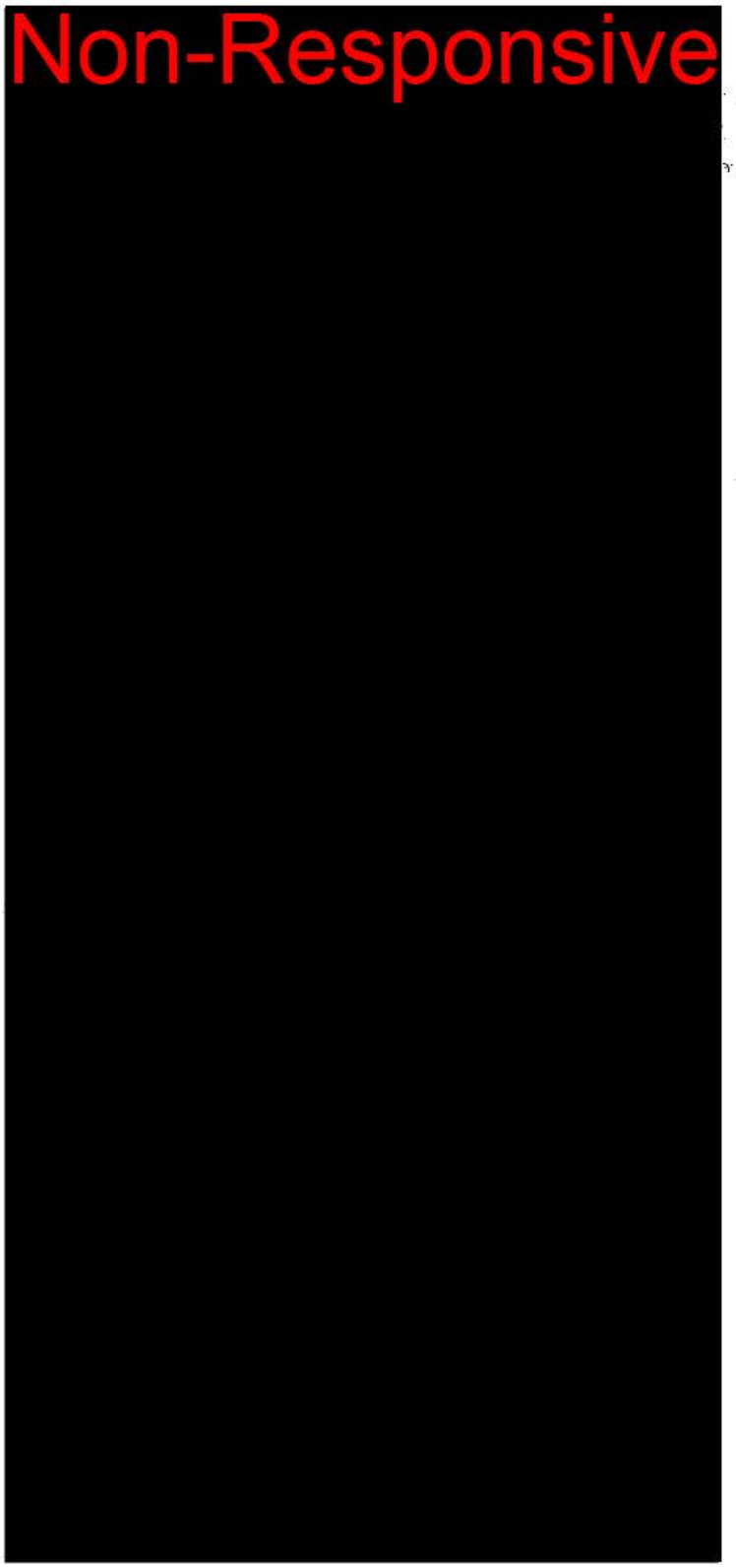
Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

April 10, 2004
Expiration Date

03518010625349
Certificate Number

[redacted]
President/Director of Training



APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (□g/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 □g/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 □g/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 µg/ft^2 on floors and 250 µg/ft^2 on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX G

PHOTOGRAPHS

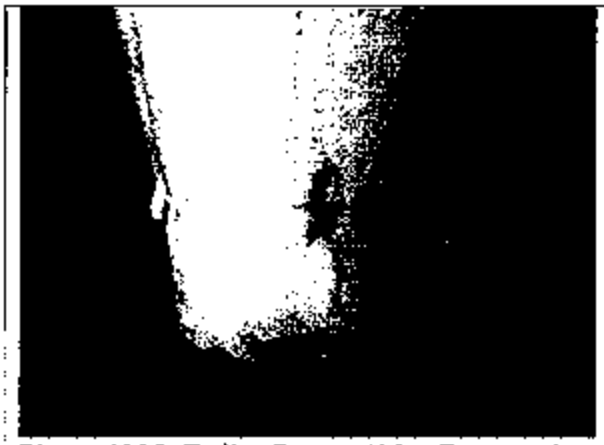

Photo 4005: Boiler Room #10 - Damaged asbestos-containing pipe fitting insulation

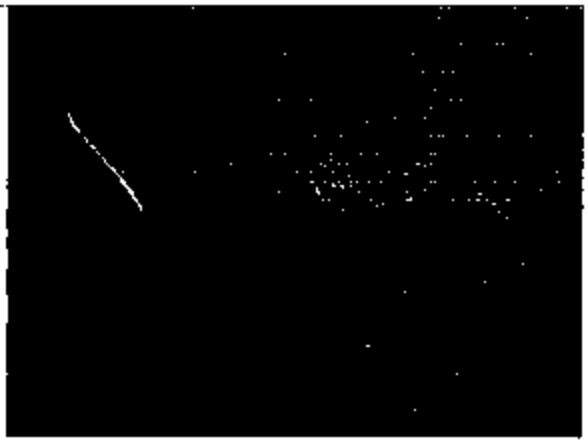

Photo 4006: Mess Hall #3 Water damaged ceiling

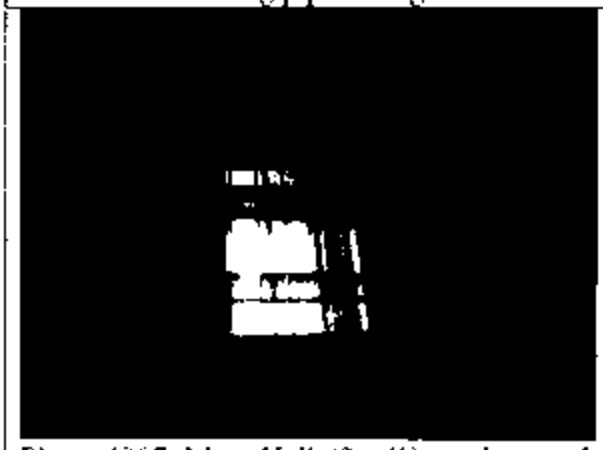

Photo 4007: Mess Hall #3 – Water damaged walls, water damaged window sill

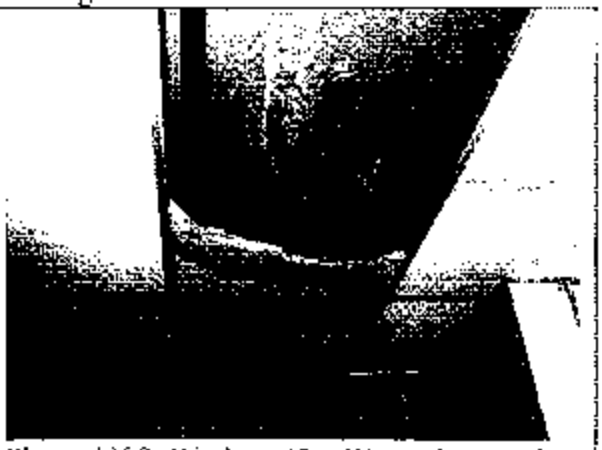

Photo 4009: Kitchen #2 Water damaged ceiling tiles

Photo 4010: Kitchen #2 Rot in wood window sill caused by water damage

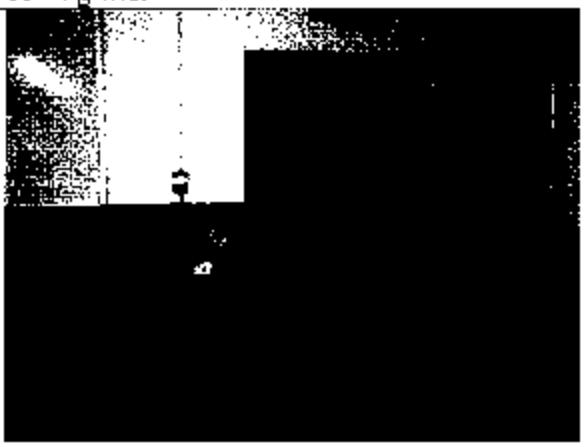

Photo 4011: Classroom #15 Obstructed emergency exit

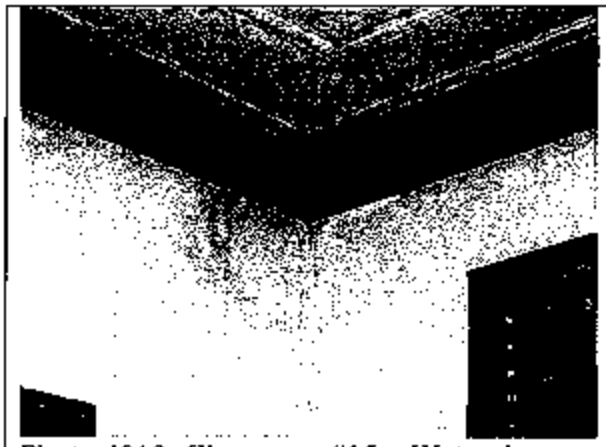

Photo 4012: Classroom #15 – Water damage to wall and ceiling

Photo 4013: Classroom #15 – Computer work station (poor ergonomics)

Photo 4014: Classroom #15 – Water damaged wall

Photo 4015: Office #23 – Damaged asbestos-containing floor tile

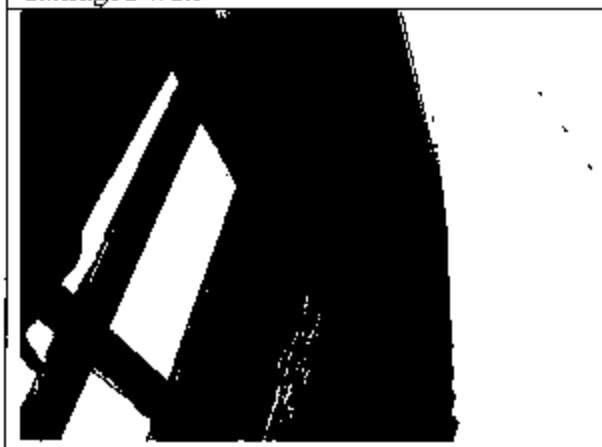

Photo 4016: Office #23 – Water damaged window sill

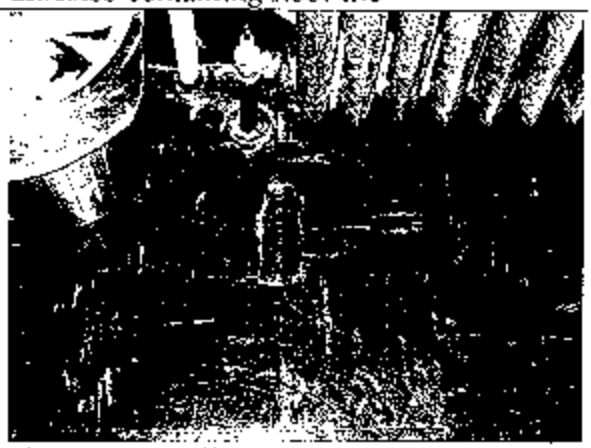

Photo 4017: Office #22 - Damaged asbestos-containing floor tile

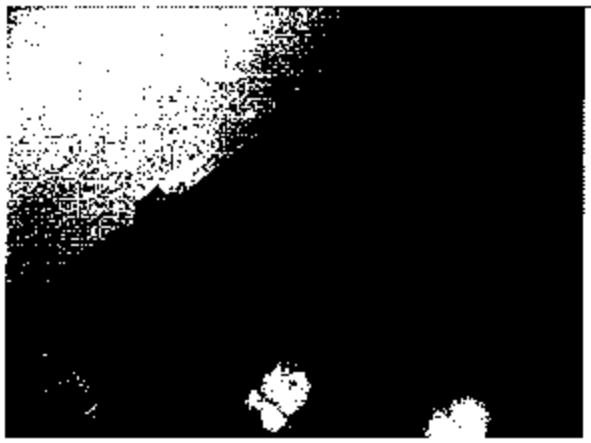

Photo 4018: Office #21 - Damaged asbestos-containing floor tile

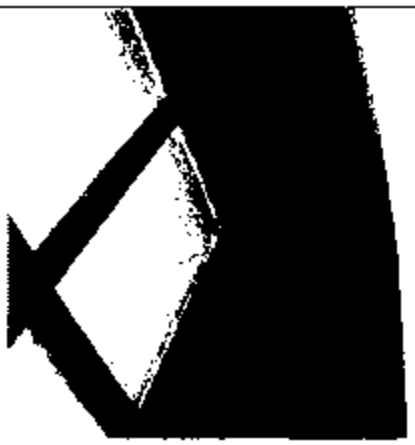

Photo 4019: Office #21 Water damaged window and wall

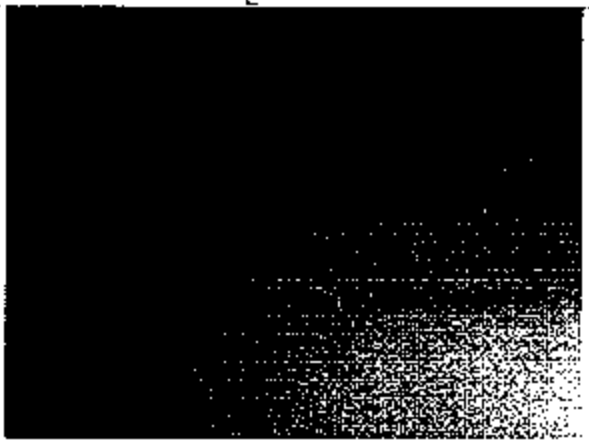

Photo 4020: Drill Shed #24 – Damaged plaster with peeling lead-based paint

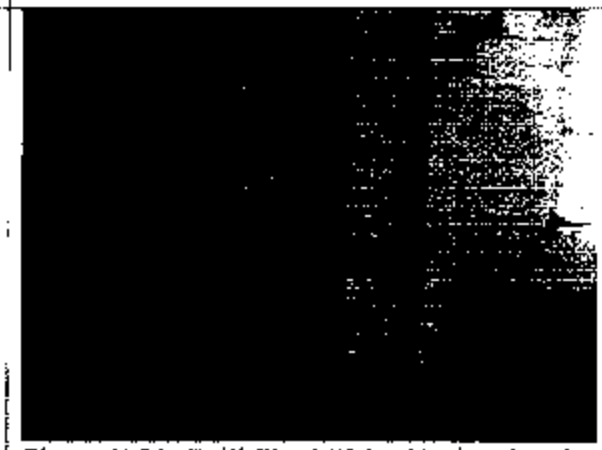

Photo 4021: Drill Shed #24 – Un-insulated steam pipes – very hot

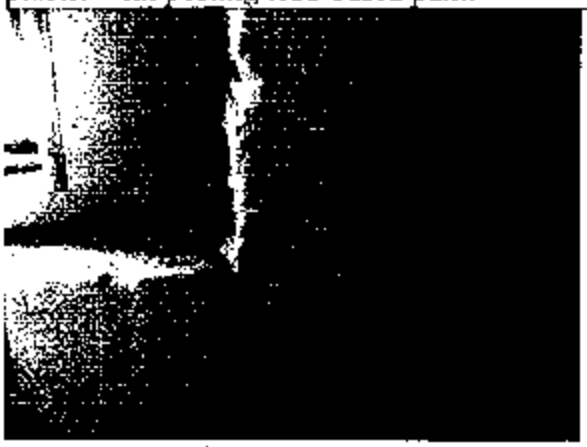

Photo 4022: Drill Shed #24 Damaged lead-based paint

Photo 4023: Drill Shed #24 – Fire extinguisher requiring re-charge

Photo 4024: Drill Shed - Damaged emergency light

Photo 4025: Room #29 - Water damaged window sill

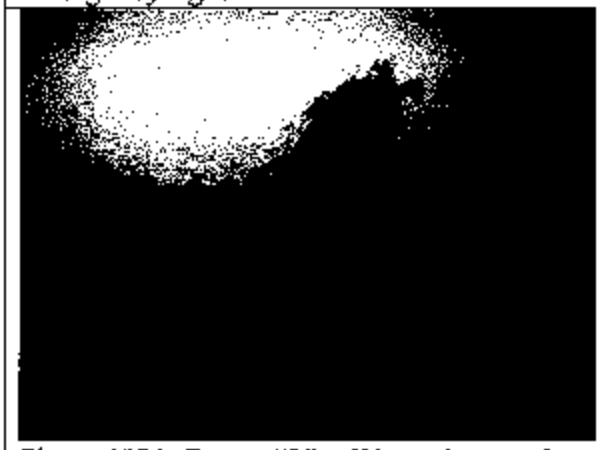

Photo 4026: Room #29 – Water damaged ceiling

Photo 4028: Hall #25 – Fire extinguisher that requires re-charging

Photo 4038: Office #16 – Computer Work station

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
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Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
NATICK READINESS CENTER
93 EAST CENTRAL STREET

Non-Responsive

Office Manager

Non-Responsive

Project Manager

September 2005
PN: 39741508

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APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lead		
Lead was detected in wipe samples collected from the former firing range in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025)	RAC 4
Peeling lead-based paint was present in room #2 and room #10.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025)	RAC 4
Asbestos		
Broken asbestos containing floor tile was found in room #27.	Remove and replace the broken floor tile with non-asbestos replacement floor tiles. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001)	RAC 3
Mold		
Water damage observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials (Best management practice)	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 93 East Central Street in Natick, Massachusetts 01760. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 24, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Natick, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building. The offices were vacant during the time of this survey. It was explained to URS that the building is for sale and will not be occupied by the ARNG.

Water marks and damage were observed on the ceilings of room # 6 (Photo # 3934); room #10 (Photo # 3937); and room # 33 (Photo # 3943). Some of these areas may have possible mold growth.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity levels on the day of the survey ranged from 35.8 – 37.9% with an average of 36.9%. This average relative humidity level was within the recommended range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 375 to 487 parts per million (ppm), with an average of 395 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE (ANSI / ASHRAE 62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Since the average interior carbon dioxide reading was 395 ppm on the day of the survey, an exterior comparison reading was not necessary.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. The carbon monoxide level remained at 0 parts per million (ppm) throughout the survey period. This measured level was below the ASHRAE guideline for indoor environments (ASI / ASHRAE 62.1-2004). Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE (ANSI / ASHRAE 62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lead

Paint chips were collected where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. Four of the seven samples were found to contain lead in a concentration above the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-1 below shows the results of the lead paint testing.

Table 2-1
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room # 3	0224-LPC02	0.01	0.058
Room # 2	0224-LPC04	0.01	7.9
Room # 2	0224-LPC05	0.01	21
Room # 2	0224-LPC06	0.01	0.26
Room # 2	0224-LPC07	0.01	17
Room # 12	0224-LPC08	0.01	0.078
Room # 10	0224-LPC10	0.01	7.6

The analytical report from AMA is contained in Appendix D.

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Hall #19 – Floor	0224-LW03	0.111	94	200
Room #21 – Top of Fire Place Mantle	0224-LW04	0.111	60	200
Room # 16 – Top of Fire Place Mantle	0224-LW05	0.111	23	200
Blank	0224-LWBlank	N/A	0.7	200

2.2.5 Asbestos

Broken 9"x9" floor tile in room #27 (Photo # 3944) was determined to contain asbestos based on a previous survey performed by ATC Associates of Woburn, Massachusetts in May of 2000.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

LEAD: The red, army green and cream paint in room #2 (Photos # 3930-31 & 3933) and the brown paint in room #10 (Photo # 3938) were determined through analytical

testing to be lead-based. Currently, there are no federal or state regulations that require removal of these materials prior to building demolition or renovation. The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint.

The three surface wipes for lead dust were found to contain lead levels within the allowable limit set by the National Guard Bureau. URS recommends that the peeling lead paint be stabilized to prevent possible spread of lead dust. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix F.

ASBESTOS: The damaged floor tile in room #27 needs to be removed by a properly trained licensed technician.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and this building area was empty at the time of URS' site visit.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Floor-Front	0224-LW06	0.111	1,600	200
Former Firing Range-Floor-Center	0224-LW07	0.111	1,000	200
Former Firing Range-Floor-Rear	0224-LW08	0.111	3,100	200
Former Firing Range-Top of a Light Guard	0224-LW09	0.111	2,000	200
Former Firing Range-Top of a Table	0224-LW10	0.111	720	200
Blank	0224-LWBlank	N/A	0.7	200

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0224-LA02	728	<4.1	50.0
Blank	0224-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

Paint chips were collected where paint was peeling and sent to AMA for analysis. The samples were found to contain lead in a concentration within the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 3-3 below shows the results of the lead paint testing.

Table 3-3
Levels of Lead in Paint Found in the Former Firing Range

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Former Firing Range #1	0224-LPC01	0.01	0.054
Former Firing Range #1	0224-LPC03	0.01	0.023

The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: The five surface wipe samples collected in the former firing range were found to contain lead dust levels above the maximum limit set by the National Guard Bureau. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix F.

Guidelines for the cleaning of former indoor firing ranges are provided in Appendix H.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 9,920 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of brick with a wood floor.

Water damage to the walls was found in the drill hall (Photo # 3941).

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Drill Hall # 26 – Floor of the Stage	0224-LW01	0.111	14	200
Drill Hall # 26 – Floor – Center	0224-LW02	0.111	15	200
Blank	0224-LWBlank	N/A	0.7	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall # 26	0224-LA01	772	<3.9	50.0
Blank	0224-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Results of the air and dust wipe samples collected in the drill hall for lead were found to be within allowable limits and require no further testing at this time.

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of brick walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

One paint chip was collected in the boiler room where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Level of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 11	0224-LPC09	0.01	0.023

The analytical report from AMA is contained in Appendix D.

5.2.2 Asbestos

The asbestos-containing boiler and pipe insulation was observed to be in good condition at the time of this survey.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

LEAD: The paint chip sample collected in the boiler room was found to contain a level of lead within the acceptable range of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. The site is now vacant and does not require a written hazardous communication program.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI / ASHRAE Standard 55-2004: Thermal Environmental Conditions for Human Occupancy

ANSI / ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING

URS

NATICK, MA

Page ____ of ____

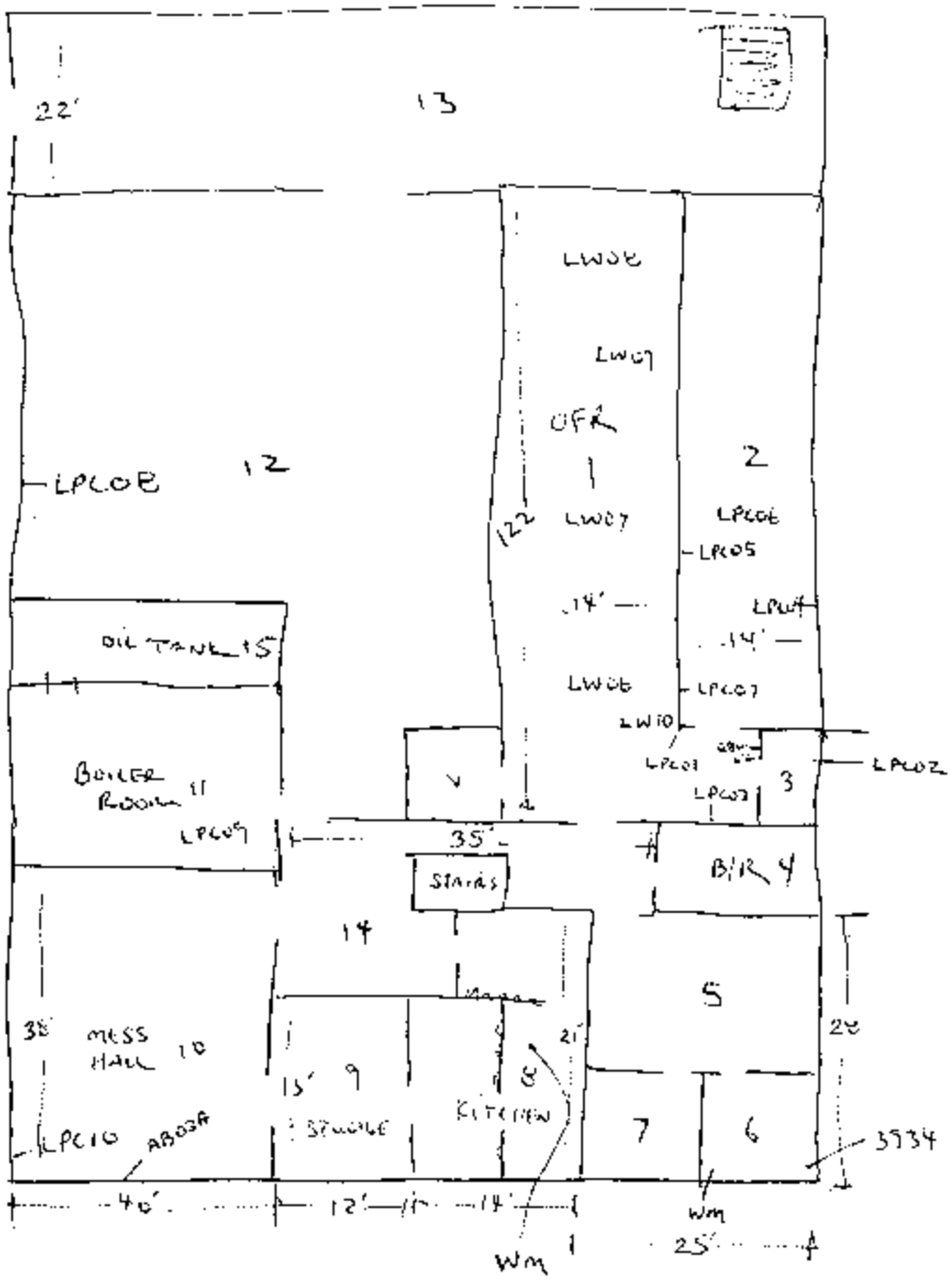
Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by _____ Date _____

Checked by _____ Date _____

Reference

BASEMENT



GRAY FLOOR PAINT THROUGHOUT

FRONT

URS

NATICK, MA

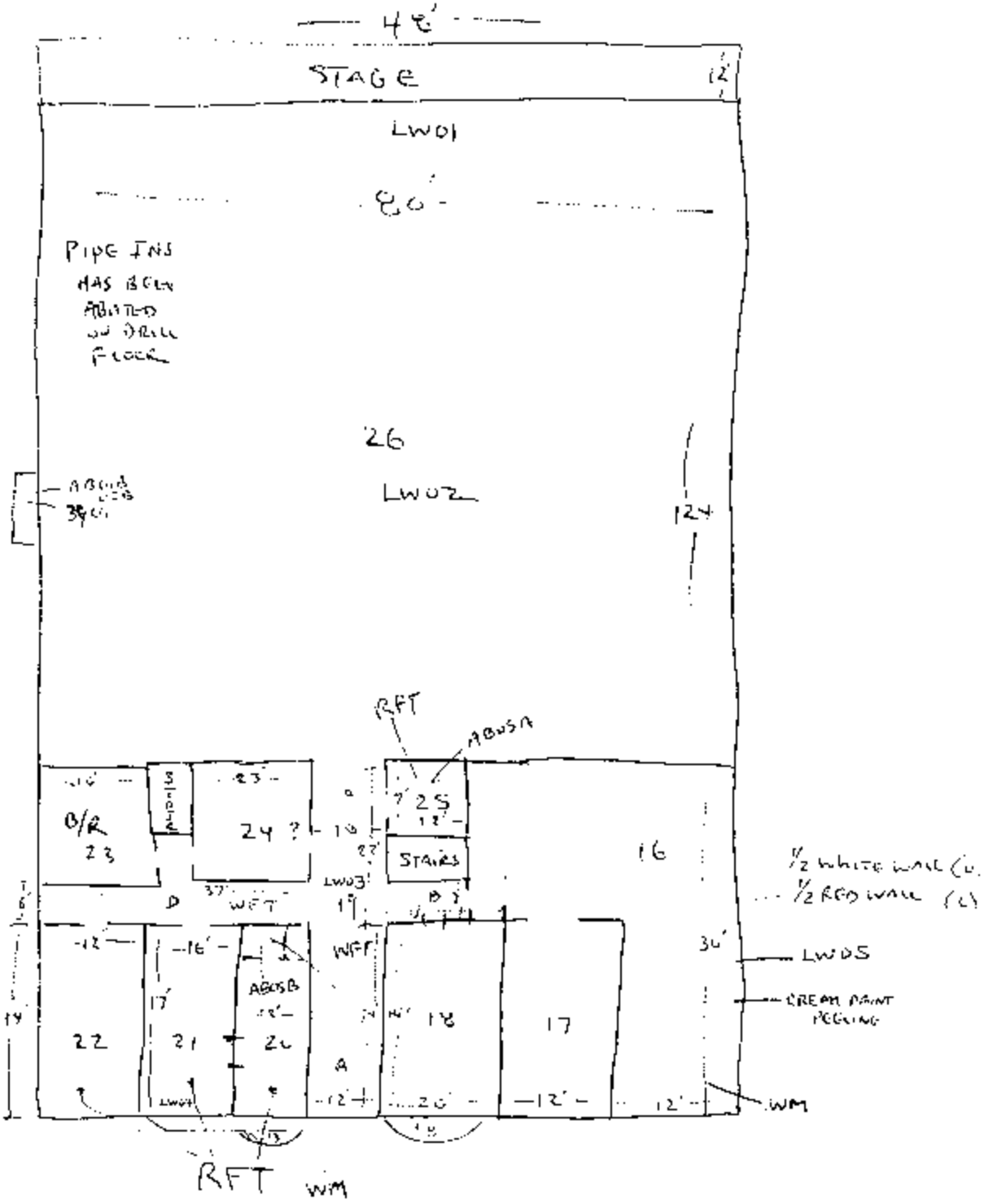
Page ____ of ____

Job ____ Project No. ____ Sheet ____ of ____

Description ____ Computed by ____ Date ____

____ Checked by ____ Date ____

Reference



RFT = RED FT (9x9)

URS

NATICK, MA

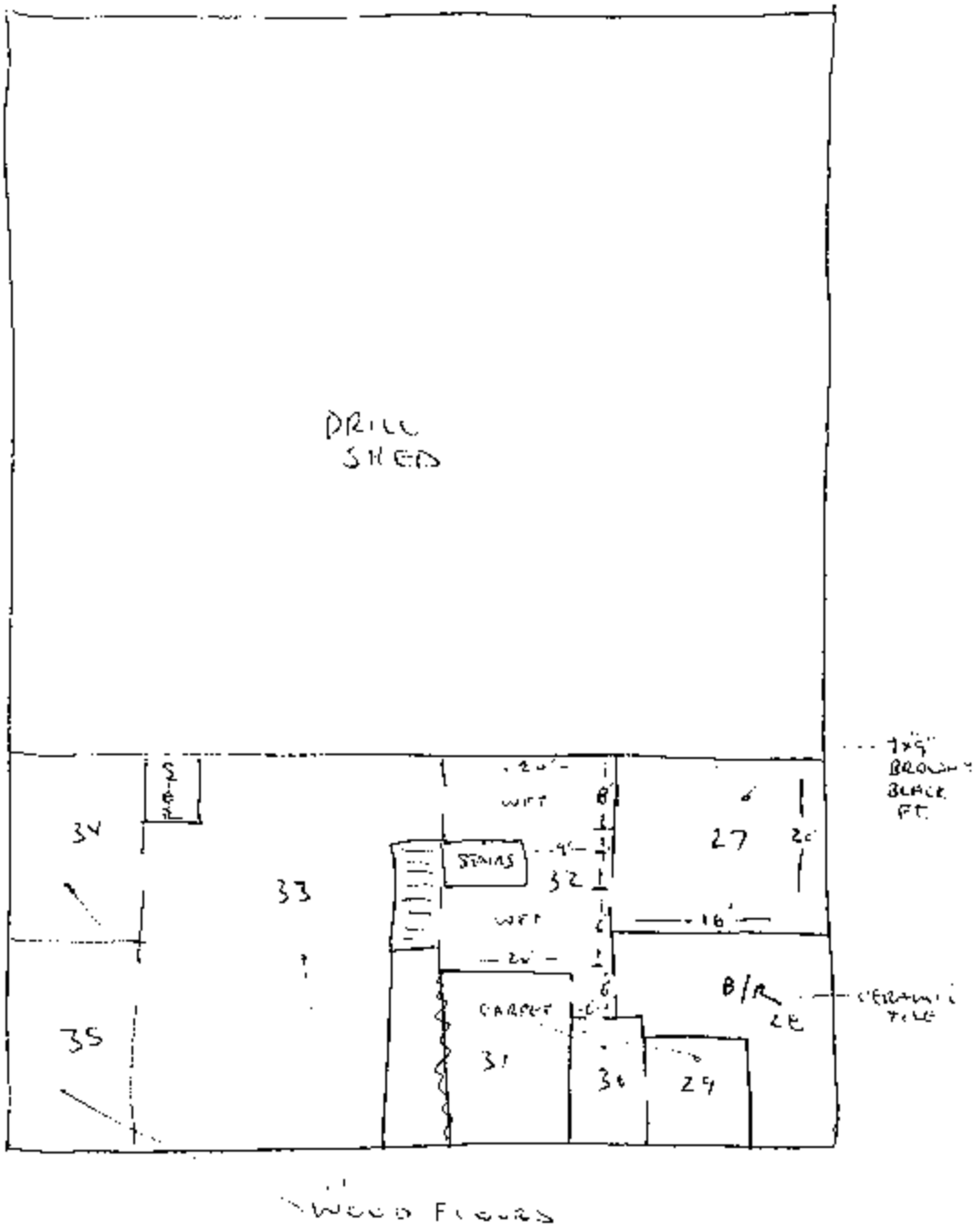
Page ____ of ____

Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference



WFT : WHITE FT (12x12)

APPENDIX B

PERSONNEL LIST

BUILDING IS CURRENTLY UNOCCUPIED

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123984
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	93 East Central Street, Natick, MA	**Date Analyzed:**	3/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	26-Mar-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0432239	0224-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.054	%Pb	
0432240	0224-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.058	%Pb	
0432241	0224-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	0.023	%Pb	
0432242	0224-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	7.9	%Pb	
0432243	0224-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	21	%Pb	
0432244	0224-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.26	%Pb	
0432245	0224-LPC 07	Flame	Paint Chip	****	N/A	0.01	%Pb	17	%Pb	
0432246	0224-LPC 08	Flame	Paint Chip	****	N/A	0.01	%Pb	0.078	%Pb	
0432247	0224-LPC 09	Flame	Paint Chip	****	N/A	0.01	%Pb	0.023	%Pb	
0432248	0224-LPC 10	Flame	Paint Chip	****	N/A	0.01	%Pb	7.6	%Pb	
0432249	0224-LW 01	Furnace	Wipe	****	0.111	2.70	ug/ft²	14	ug/ft²	
0432250	0224-LW 02	Furnace	Wipe	****	0.111	2.70	ug/ft²	15	ug/ft²	
0432251	0224-LW 03	Furnace	Wipe	****	0.111	13.50	ug/ft²	94	ug/ft²	
0432252	0224-LW 04	Furnace	Wipe	****	0.111	6.75	ug/ft²	60	ug/ft²	
0432253	0224-LW 05	Furnace	Wipe	****	0.111	2.70	ug/ft²	23	ug/ft²	
0432254	0224-LW 06	Flame	Wipe	****	0.111	108.01	ug/ft²	1600	ug/ft²	
0432255	0224-LW 07	Flame	Wipe	****	0.111	108.01	ug/ft²	1000	ug/ft²	
0432256	0224-LW 08	Flame	Wipe	****	0.111	108.01	ug/ft²	3100	ug/ft²	
0432257	0224-LW 09	Flame	Wipe	****	0.111	108.01	ug/ft²	2000	ug/ft²	
0432258	0224-LW 10	Flame	Wipe	****	0.111	108.01	ug/ft²	720	ug/ft²	

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	123984
Address:	301-lH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	93 East Central Street, Natick, MA	**Date Analyzed:**	3/26/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	26-Mar-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result	
0432259	0224-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30 ug		0.7	ug
0432260	0224-LA 01	Flame	Air	772	N/A	3.89 ug/m³	<	3.9	ug/m³
0432261	0224-LA 02	Flame	Air	728	N/A	4.12 ug/m³	<	4.1	ug/m³
0432262	0224-LA 03	Flame	Air Blank	0	N/A	3.00 ug/m³	<	3	ug

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analys[redacted] Non-Responsive

Technical Manager: [redacted]

APPENDIX E

TRAINING CERTIFICATES

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

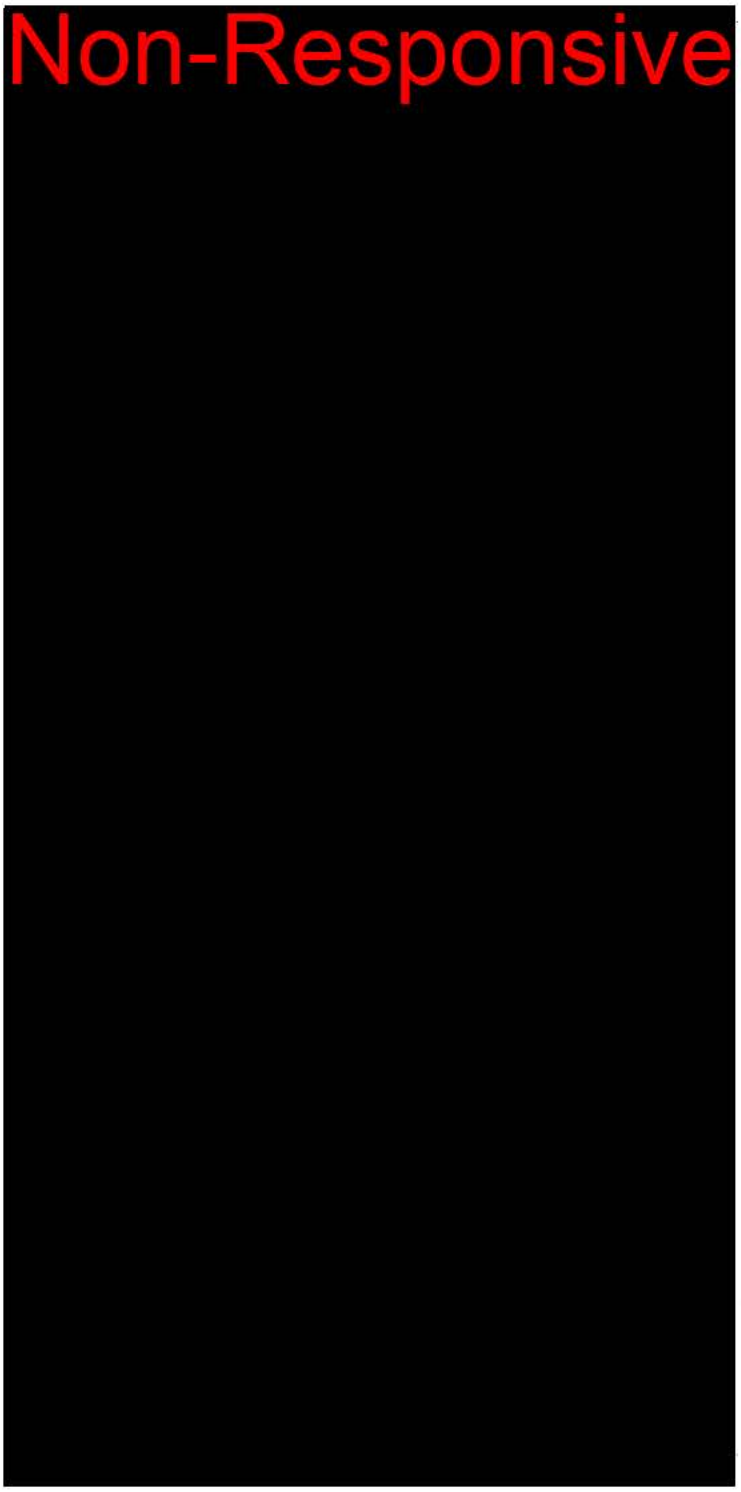
Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
President/Director of Training


Non-Responsive

APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

APPENDIX G

PHOTOGRAPHS

Photo 3930: Room #2 Red lead-based paint

Photo 3931: Room #2 – Army green lead-based paint

Photo 3933: Room #2 – Cream lead-based paint

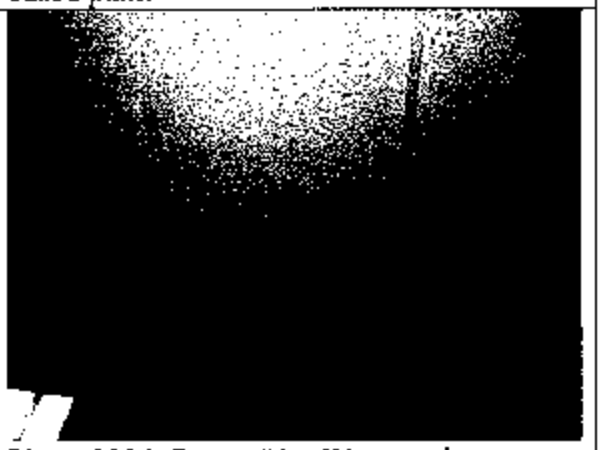


Photo 3934: Room #6 – Water stains on ceiling tile

Photo 3937: Mess Hall #10 – Water stains on ceiling tiles

Photo 3938: Mess Hall #10 Brown lead-based paint

Photo 3941: Drill Shed #26 - Water damage

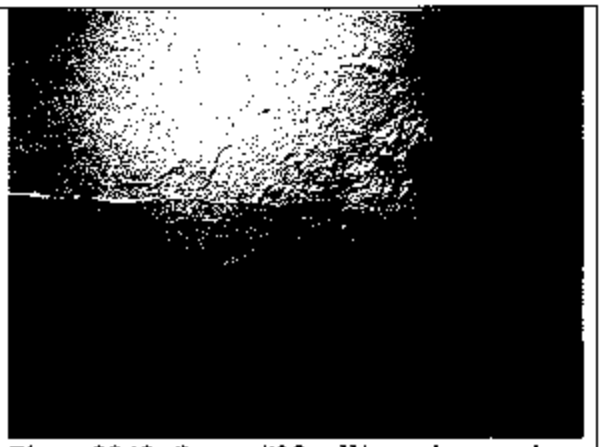


Photo 3943: Room #33 – Water damaged ceiling

Photo 3944: Room #27 – Asbestos-containing floor tile

APPENDIX H

Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

NGB-AVS

5 December 2001

MEMORANDUM FOR THE ADJUTANTS GENERAL OF ALL STATES, PUERTO RICO, THE US VIRGIN ISLANDS, GUAM, AND THE COMMANDING GENERAL OF THE DISTRICT OF COLUMBIA

SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

1. References:

a. AR 385-63, Policy and Procedures, 15 November 1983.

b. DODI 6055.9-STD, DOD Ammunition and Explosive Safety Standards, August 1997.

c. DODIG Report #98-170, subject: ARNG and U.S. Army Reserve Command Small Arms IFR, 30 June 1998.

d. AR 385-10, The Army Safety Program, 29 February 2000.

e. All States Memorandum, NGB-AVS, 18 September 2000, subject: (All States Log Number P00-0059) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges.

2. The policy and procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges are enclosed. Guidelines for Rehabilitation, Conversion, and Cleaning of IFRs are provided in the Addendum. These policies apply to all persons responsible for the operation, rehabilitation, conversion, and cleaning of ARNG IFR and satisfy the requirements of the references listed above.

3. The enclosed document contains sample formats of the forms necessary for the routine operation of IFRs. Additionally, an IFR Standing Operating Procedure is provided to assist each State/Territory in developing local guidance consistent with the needs of the individuals that use their range(s).

4. The contents of this memorandum will be incorporated into the revision of NGR 385-15, Policy and Responsibilities for Evaluation, and Operation of ARNG Indoor Firing Ranges, and National Guard Pamphlet 385-15, Guidance and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

NGB-AVS
SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning Inspection

5. This memorandum expires 30 November 2002, unless sooner rescinded or superseded.

6. Point of contact is Colonel Non-Responsive Chief, Aviation and Safety Division, at DSN 327-7700 or 703-607-7700.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

Non-Responsive

Encl
as

Lieutenant General, GS
Director, Army National Guard

CF:
NGB-IG
NGB-ART
NGB-ARO
NGB-ARE
NGB-ARI
NGB-ARS
NGB-PL
NGB-ARZ-PC
Each State IG
Each State Safety Office
Each State Occupational Health Nurse
Each State Training Site Commander
Each State USPFO
Each Regional Industrial Hygienist

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Contents

1-1. General
This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

1-2. Explanation of abbreviations and terms
Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

1-3. Policy
a. Ammunition shall only be fired in properly classified indoor firing ranges.
b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
f. New ranges shall be designed using the latest standards provided by NGB-ARI.
g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

Responsibilities

1-4. Director, Army National Guard (DARNG)
The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

1-5. Chief, Aviation and Safety (NGB-AVS)
The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:
a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
b. Coordinate with other HQDA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall- -
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

1-7. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-8. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall- -

a. Provide the design standards for the construction of indoor firing ranges.

b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

1-9. The State Adjutant General
The State Adjutant General shall- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.

c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

1-10. State Safety Manager
State Safety Managers shall--

a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.

b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.

c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.

d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.

e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

f. Approve the use of the range by non-military organizations.

g. Maintain copies of all range inspections, ventilation measurements and visitors log.

1-11. State Occupational Health Nurse
The Occupational Health Nurse shall- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.

b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.

d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

1-12. State Environmental Office
The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

1-13. Facility Commanders
Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.

b. Indoor firing ranges are secured when not in use.

c. A custodian is appointed for all indoor firing ranges under his/her area of command.

d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.

e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.

f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.

g. All required signs are posted IAW Section 1-22 of this regulation.

h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.

i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).

j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.

k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.

m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.

n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).

o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter (mg/m^3).

p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.

q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.

r. The ventilation system is in operation at all times during firing or cleaning.

1-14. Range Custodians
Custodians shall- -

a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.

b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

1-15. Unit Commanders

Unit Commanders shall--

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using **"limited use"** firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as **"limited use"** ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

1-16. Procedures, classification and use

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

1-17. Classification of ranges

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as **"safe", "limited use"** or **"unsafe"**. **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for Intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in DG 415-1, Appendix A or CEHND 1110-1-18).

(1) Safe ranges.

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

(2) Unsafe ranges.

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

b. **Ventilation**

(1) **Safe ranges.**

(a) The range has an operational mechanical ventilation system.

(b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).

(c) Air is exhausted at or behind the bullet trap.

(d) Supplied air is introduced into the range behind the shooters.

(e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.

(f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.

(h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of water gauge (wg) but does not exceed -.20 wg.

(i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)

(j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.

(k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

(2) **Unsafe ranges.**

(a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.

(b) The range has no mechanical ventilation.

(c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.

(d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.

(e) Air is exhausted anywhere other than at the bullet trap.

(f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.

(g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -. 05 wg or in excess of -. 2 wg.

(h) The range is under positive pressure.

(i) The supply and exhaust air systems are not electrically interlocked.

c. **Range lighting.**

(1) **Safe ranges.**

(a) Lighting is uniform, non-glaring and does not cause shadows.

(b) Illumination is at least 100 foot candles on the targets and 30 foot- candles in all other areas.

(c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.

(d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.

(e) Emergency lights are provided behind the firing line and are in working condition.

(f) Exit lights are provided as required.

(g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

(2) **Unsafe ranges.**

(a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. **Bullet traps.**

(1) **Safe ranges.**

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.

(c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

(2) **Unsafe ranges.**

(a) Steel bullet traps are bowed, punctured or severely pitted.

(b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

e. **Targets and target carriers.**

(1) **Safe ranges.**

(a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).

(b) Only paper targets are used.

(2) **Unsafe ranges.** Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

f. **Lead levels.**

(1) **Safe ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels do not exceed 0.05 mg/m^3.

(b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed 0.03 mg/m^3.

(c) For personnel under the age of 18, see Figure 1-1.

(2) **Limited use ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels exceed 0.05 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed 0.03 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample.

(3) **Unsafe ranges.**

Lead levels in air sample results exceed 0.4 mg/m^3 in any breathing zone or general area sample.

1-18. Range use

a. Indoor firing ranges shall not be used for any purpose other than firing. (I.e., they shall not be used for classrooms, exercise rooms, storage, etc.).

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

1-19. Prohibitions

a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.

c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.

d. Variable speed fans are *not* permitted.

e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.

f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.

g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.

h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.

I. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.

j. There are no open floor drains in the range.

k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

1-20. Personal protective equipment

a. **Eye protection.** All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1999, Practice for Occupational and Educational Eye and Face Protection.

b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.

c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

1-21. Posting warning signs

a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:

(1) Eating, Drinking and Smoking are *prohibited*
(2) Dry Sweeping is *prohibited*
(3) Wash Hands and Face Immediately Following Firing
(4) Only the Following Ammunition is *authorized* for use on this Range: _____
(5) Hearing Protection *shall be* properly worn during firing
(6) Proper Safety Glasses/Goggles *shall be* worn during firing
(7) Furniture or storage of other items of equipment is *not* permitted in the range

b. The following signs shall be posted on the entrance door to the range:

(1) Noise Hazardous Area
(2) Danger Lead Hazard Area
(3) Pregnant women are *not* permitted in this area.

c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.

e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

Note: All signs shall meet the requirements of DA Pam 385-64.

1-22. Range Standing Operating Procedures.

a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

(a) Name and age of shooter.

(b) Organizations (if civilian, include address and phone number).

(c) Sign-in and sign-out times and date.

(d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

1-23. Inspection requirements.

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

1-24. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

1-25. Annual inspections

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

1-26. Ventilation requirements

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

1-27. Air sampling requirements

a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m^3 sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(ii).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

1-28. Inspection reports

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

1-29. Record maintenance

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

1-30. Control of potential Lead intoxication

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

(1) A description of each operation where Lead is emitted;
(2) Methods used to achieve compliance;
(3) Methods used to meet the permissible exposure level;
(4) Air monitoring data, which documents the source of air emissions;
(5) A detailed schedule for implementation of the program;
(6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
(7) Administrative control schedule;
(8) Personnel enrollment in medical surveillance;
(9) Other relevant information.

b. Refer to TG 208 for specific guidance on developing the compliance program.

1-31. Alternative ammunition

a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

1-32. Maintenance requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline stalic pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

(5) Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

1-33. Housekeeping

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are ¾ full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

1-34. Maximum exposure hours
Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m^3 or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed $0.03\ mg/m^3$. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

1-35. Extent of use
a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m^3. For ranges with Lead concentrations less than 0.100 mg/m^3, follow the guidelines in Figure 1-1.
d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

1-36. Medical surveillance
a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m^3) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

1-37. Terms
a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

FIGURE 1-1

0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 – 0.499	0.75	0.5	0
0.500 – 0.749	0.5	0.25	0
0.750 – 0.999	0.25	0.25	0
1.000 or above	0	0	0

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range _____ Date _____

Range Custodian _____ Telephone _____

Part 1, Physical Safety Inspection

A. Building Envelope

_____ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]

_____ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17a(1)(d)]

_____ 4. There are no open floor drains in the range. [1-17a(2)(c)]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]

_____ 7. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]

_____ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]

_____ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))

_____ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))

_____ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))

_____ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]

_____ 6. Exit lights are provided and working as required. [1-17c(1)(f)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, the Addendum, and this regulation. [1-17d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]

_____ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]
(Any one firing lane without a retrieval system shall not be used for firing)

_____ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]

_____ 3. Only paper targets are used in the range. [1-17e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [1-18a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]

_____ 3. No additional clothing or equipment is brought into the range. [1-19h]

_____ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-19a]

_____ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]

_____ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]

_____ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

F. Range maintenance

_____ 1. Dry sweeping does not occur in the range. [1-19e]

_____ 2. No brooms are located in the range. [1-19e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
- _____ a. Eating, Drinking and Smoking are *Prohibited*
- _____ b. Dry Sweeping is *Prohibited*
- _____ c. Wash Hands and Face Immediately Following Firing
- _____ d. The Following Ammunition is authorized for use on this Range: _____
- _____ e. Hearing Protection *shall be* Properly worn during firing
- _____ f. Proper Safety Glasses/Goggles *shall be* worn during firing
- _____ g. No Furniture or Storage of Items Permitted in the Range

_____ 2. The following signs are posted on the entrance door to the range: [1-21b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant women are *not* permitted in this Area

_____ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters. [1-21c]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

_____ 2. The range SOP includes as a minimum the following: [1-22b]

_____ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

_____ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

_____ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

_____ d. Instructive guidance for all range procedures.

_____ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

_____ f. Authorized ammunition for the range.

_____ g. The requirement for posting of signs IAW section 1-21 of this regulation.

_____ h. Cleaning and maintenance requirements.

_____ i. Personal protective equipment requirements for maintenance, firing and cleaning.

J. Recordkeeping

_____ 1. A visitors log is maintained which includes the following information for all visitors/shooters: [1-14c]

_____ a. Name and age of shooter.

_____ b. Organization (if civilian, include address and phone number).

_____ c. Sign in and sign out times.

_____ d. Type of ammunition used and number of rounds fired.

_____ 2. Copies of initial and other previous inspections are available. [1-24a]

_____ 3. The initial inspection report includes air-sampling data. [1-24b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

_____ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

_____ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

_____ 7. Range safety officer(s) is/are designated. [1-13c]

K. New and Renovated Ranges

_____ 1. No doors are installed in the plenum wall.

_____ 2. Plenum area is at least 4 feet deep.

_____ 3. An access door is installed behind the bullet trap.

_____ 4. Only escalator or rubber bullet traps are installed.

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 2, Ventilation Inspection

A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]

_____ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]

_____ 4. Make-up air is introduced into the range behind the shooters. [1-17b(1)(d)]

_____ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [1-17b(1)(e)]

_____ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [1-17b(1)(f)]

_____ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]

_____ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]

_____ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(i)]

_____ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails.
[29 CFR 1910.1025(e)(4)(ii)]

_____ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, J-2a]

_____ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]

_____ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]

_____ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]

_____ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

B. New and Renovated Ranges

_____ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.

_____ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.

_____ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 4. Passive supply systems have opposing blade louvers.

_____ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____

2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____

3. Air sampling has been scheduled for: _____

Print and sign: _____

Position: _____ Date: _____

4. Air sampling was completed on: _____ for the following types of ammunition: _____.

5. Air sample results do not exceed: _____ mg/m^3 (results are attached)

6. For military personnel exposed less than 30 days per year, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

Print and sign: _____

Position: _____ Date: _____

FIGURE 1-3
EXAMPLE OF INDOOR FIRING RANGE SOP
STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXX
_____ ARMORY INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

1. References:

a. AR 385-10
b. AR 385-63
c. NGR 385-10
d. NG PAM 385-XX
e. 29 CFR 1910.1025
f. 29 CFR 1920.1200
g. 29 CFR 1926
h. 29 CFR 1960
I. USACHPPM, TG 141

2. Purpose. The _____ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

3. Review and Update. This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

4. General.

a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.

b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

5. Range Control.

a. The _____ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

(1) Enforce the facility range safety program and SOP.

(2) Notify Armory personnel of times when the range shall be in use.

(3) Coordinate and schedule all activity on the firing range.

(4) Ensure that the range is secured when not in use.

(5) Ensure that nothing is stored at the range.

(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Safe Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCOIC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (Appendix C of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paragraph 1-21 are posted as required.

6. **Range OIC/NCIOC.** The Commander or supervisor of all using units or groups shall designate an OIC/NCOIC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range have singed-in on the roster maintained by the facility Commander.

(10) Ensura that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from _____ to _____ hours.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.

(3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.

(4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.

(5) Ensure that weapons are cleared and checked during temporary suspension of firing.

(6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

c. After Firing.

(1) Ensure that all weapons are cleared prior to being removed from the firing line.

(2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

(3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**

(4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

7. Range Control Officer Qualifications. His or her commander may appoint any individual in the rank of E-6 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

8. **Range Restrictions.**

a. The _____ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

EXAMPLE

(1) .22 caliber including the M-16 with adapter
(2) .38 caliber
(3) .45 caliber
(4) 9 mm pistols

Note: No other weapons can be fired without the approval of the State Safety Manager.

b. Pellets, BBs, magnum and armor piercing rounds are prohibited.

c. Dry sweeping of the range is prohibited.

d. Trick shooting including, quick draw and hip shooting is prohibited.

e. Storage of any item in the range is prohibited.

f. Smoking and consumption of food or beverages is prohibited.

g. Proper hearing and eye protection shall be worn during firing.

h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.

i. Personnel shall not be allowed in the observation/plenum area during firing.

9. **Mandatory Signs.** As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

(1) Eating, drinking and/or smoking are prohibited.

(2) Dry sweeping is prohibited.

(3) Wash hands and face immediately after firing.

(4) Hearing protection shall be worn during firing.

(5) Safety glasses/goggles shall be worn during firing.

(6) Storage of furniture and other items is prohibited.

(7) The following ammunition is authorized for this range: _____, _____, _____, and _____.

b. On the Door to the Range.

(1) Noise Hazardous Area.

(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

10. **Authorized Use of the Range.** Utilization of the _____ Armory range is authorized for organizations of the _____ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of _____.

11. **Release of Liability.**

a. The military Range Control Officer shall obtain a signed Release of Liability (Appendix D of this SOP) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (Appendix D of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

12. **Denial of Range Access.** The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe
CPT, IN, ___ARNG
OIC/Armory Commander

APPENDIX A
ABBREVIATIONS

ANSI
American National Standards Institute

AR
Army Regulation

ARNG
Army National Guard

CFM
Cubic feet per minute

CFR
Code of Federal Regulations

CNGB
Chief, National Guard Bureau

DA
Department of the Army

FPM
Feet Per Minute

HEPA
High Efficiency Particulate Air

IAW
In Accordance With

IFR
Indoor Firing Range

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standing Operating Procedure

SP
Static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

wg
Inches of water gauge

APPENDIX B
REFERENCES

ACGIH 22nd Ed, Industrial Ventilation
A Manual of Recommended Practice

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 350-41
Army Forces Training

AR 385-63
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64
U.S. Army Explosives Safety Program

Army National Guard (ARNG) Design Guide (DG) 415-1
Design Guide for Armories

American National Standards Institute (ANSI) Z87.1-1999
Practice for Occupational and Educational Eye and Face Protection

CEHND 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

Department of the Army Pamphlet (DA PAM) 385-64
U.S. Army Explosives Safety Program

DA PAM 40-501
Hearing Conservation

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges

FM 25-7
Training Ranges

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development

APPENDIX B (Continued)

GR 420-10
Operations/Maintenance and Minor Construction, Army National Guard

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TG 208
USACHPPM Technical Guide for Indoor Firing Ranges

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910
Occupational Safety and health Standards

APPENDIX C
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. All weapons shall be cleared and muzzles pointed downrange.

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. The primary telephone to be used in case of an emergency is located _____. The emergency numbers are _____.

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN _____, or the duty officer, and the State Safety and Occupational Health Office at DSN _____.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

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APPENDIX D
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

_____ ARNG
Somewhere, USA
Date: _____

BE IT KNOWN TO ALL: WHEREBY I, _____;
Have been granted permission to use firearms on the indoor firing range located at the _____ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of ____ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of ____, the ____ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of ____, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: _____

Witness to Signature: _____

In case of emergency, please contact:
Name _____
Address _____
_____
Telephone Number _____

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.
I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: _____

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ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References

Related publications are listed below.

a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (PREFERRED METHOD)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, healing system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually seated package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

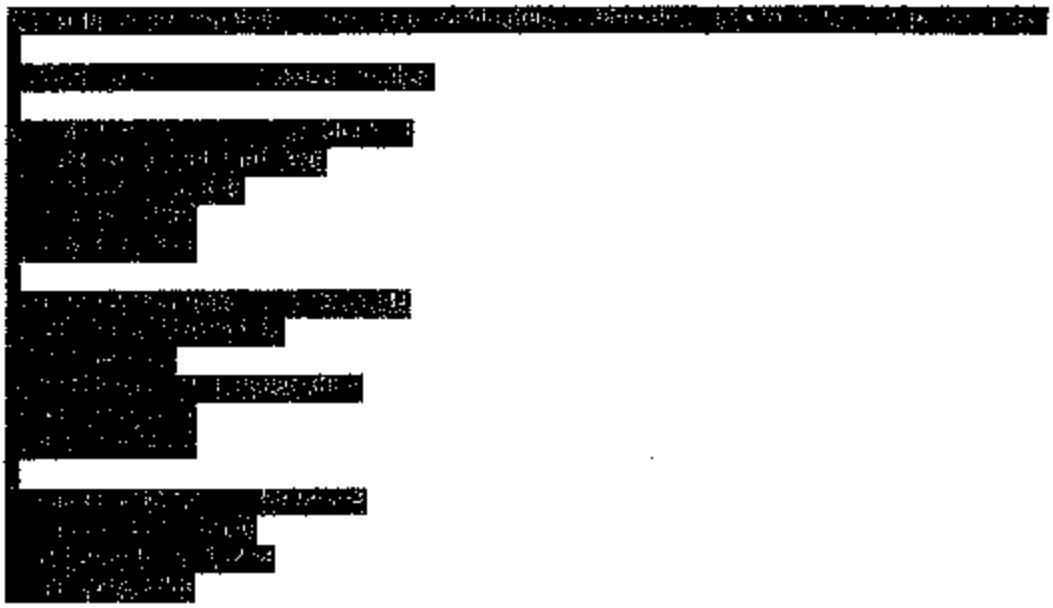
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-6828
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks
Comments to Lab:			

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
NEW BEDFORD READINESS CENTER
5 SYCAMORE STREET
NEW BEDFORD, MASSACHUSETTS

Non-Responsive

Office Manager

Non-Responsive

Project Manager

October 2005
PN: 39741508

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in over half of all offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the former firing range and drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Exposed asbestos-containing pipe fitting, pipe and boiler insulation were found in the drill hall and boiler room.	Repair or remove exposed asbestos pipefittings, pipe and boiler insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site-specific asbestos operations and maintenance plan was available but not implemented.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Housekeeping		
Electrical panels obstructed by equipment in the drill hall. Electrical panels must be kept clear of obstruction	Remove all obstructions in front of electrical panels in the drill hall for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i)).	RAC 2

Mold		
Water damage was observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Fire Safety		
An obstructed fire extinguisher was found in hall # 6.	Fire extinguishers must be made available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher (OSHA 29 CFR 1910.157(c)(1)).	RAC 2

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 5 Sycamore Street in New Bedford, Massachusetts 02740. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 4, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in New Bedford, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Mr. Non-Responsive Non-Responsive of the Massachusetts Army National Guard was Mr. Non-Responsive ite contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A. The risk assessment codes associated with this project are contained in Table 1.

2.0 ADMINISTRATIVE AREA

2.1 OPERATION DESCRIPTION

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chair armrests were in a fixed position and keyboards could not be adjusted in only a few offices. If more than one person is using that station, then proper adjustments need to be made to accommedate each person.

Water marks and damage were observed on the ceilings of office # 1 (Photo # 3521); office #2 (Photo # 3527); office #3 (Photos # 3524-25); office #5 (Photo # 3526); office #10 (Photo # 3529); office #12 (Photo # 3533); office #16 (Photo # 3530); office #31 (Photo # 3531); office #26 (Photo # 3537); bathroom #26A (Photo # 3536) and office # 33 (Photo # 3540). Some of these areas may have possible mold growth.

An obstructed fire extinguisher was found in hallway #6 which did not have its location marked (Photo # 3528).

2.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 18.4 – 25.3% with an average of 20.0% on the 1st floor. The 2nd floor ranged from 20.5 – 21.0% with an average of 20.7%. The 3rd floor ranged from 23.8 – 27.0% with an average of 24.6%. The basement ranged from 28.3 – 31.1% with an average of 30.4%. These average readings were below the recommended range of 30.0% to 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004), with the exception of the basement.

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 379 to 442 parts per million (ppm), with an average of 403 ppm on the 1st floor. The 2nd floor concentrations ranged from 399 to 468 ppm, with an average of 405 ppm. The 3rd floor concentrations ranged from 398 to 437 ppm, with an average of 403 ppm. The basement concentrations ranged from 405 to 468, with an average of 413 ppm. Carbon dioxide levels were measured using a direct reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and

increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Since the average interior carbon dioxide level was below 700 ppm for all floors an outside reading was not collected.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. Carbon monoxide concentrations ranged from 0 to 4 ppm throughout the survey period for all floor levels. The measured levels were below the ASHRAE guideline for indoor environments (62.1-2004). Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Office # 7	Administrative Duties	255 / 237	500 / 50
Office # 9	Administrative Duties	545 / 50.6	500 / 50
Office # 10	Administrative Duties	480 / 44.6	500 / 50
Office # 11	Administrative Duties	367 / 34.1	500 / 50

Table 2-1 (Continued)
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Minimum Illuminance (lux / foot candles)
Office # 12	Administrative Duties	264 / 24.5	500 / 50
Office # 14	Administrative Duties	751 / 69.8	500 / 50
Office # 15	Administrative Duties	569 / 52.9	500 / 50
Office # 16	Administrative Duties	582 / 54.1	500 / 50
Office # 17	Administrative Duties	312 / 29.0	500 / 50
Office # 18	Administrative Duties	383 / 35.6	500 / 50
Office # 21	Administrative Duties	131 / 12.2	500 / 50
Office # 22	Administrative Duties	624 / 58.0	500 / 50
Office # 26	Administrative Duties	525 / 48.8	500 / 50
Office # 27	Administrative Duties	610 / 56.7	500 / 50
Office # 28	Administrative Duties	568 / 52.8	500 / 50
Office # 29	Administrative Duties	690 / 64.1	500 / 50
Office # 31	Administrative Duties	077 / 7.2	500 / 50
Office # 33	Administrative Duties	187 / 17.4	500 / 50
Hallway # 6	Accessway	239 / 22.2	30 / 3
Hallway # 19	Accessway	146 / 13.6	30 / 3
Hallway # 39	Accessway	118 / 11.0	30 / 3

On the day of the survey the illuminance in the administrative area was inadequate in approximately half the offices.

2.2.5 Lead

Paint chips were collected in three areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. One sample (0204-LPC02) was found to contain lead in a concentration above the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room #1 - 3rd Floor	0204-LPC01	0.01	0.11
Hall/Stairs – 3rd Floor	0204-LPC02	0.01	35
Hall Stairway # 35	0204-LPC03	0.02	0.025

The analytical report from AMA is contained in Appendix D.

2.2.6 Asbestos

No asbestos issues were found in the administrative area during this survey.

2.3 VENTILATION SYSTEM EVALUATION

Not applicable to this operation.

2.4 NOISE MEASUREMENTS

Not applicable to this operation.

2.5 PERSONAL PROTECTIVE EQUIPMENT

Not applicable to this operation.

2.6 INTERPRETATION OF RESULTS

GENERAL: In general, the administrative area was neat and orderly.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in approximately half the offices. URS recommends increasing lighting in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: One of the three paint chips tested (Photo # 3523), has a lead content greater than 0.5% by weight. The brown paint located in the third floor hallway and stairs must be classified as "lead-based paint". URS recommends that the paint be stabilized and made intact by technicians trained in accordance with the OSHA lead standard (29 CFR 1910.1025).

FIRE SAFETY: An obstructed fire extinguisher was found in hallway #6 which did not have its location marked (Photo # 3528).

MOLD: The water stains on the ceilings could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 OPERATION DESCRIPTION

The firing range has been dismantled and this building area is now primarily used for storage.

3.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Firing Range-Top of Light Guard	0204-LW07	1.000	1900	200
Firing Range-Top of a Table	0204-LW08	1.000	590	200
Firing Range-Floor – Rear	0204-LW09	1.000	1800	200
Firing Range-Floor – Center	0204-LW10	1.000	510	200
Firing Range-Floor - Front	0204-LW011	1.000	2200	200
Blank	0204-LWBlank	N/A	<12	200

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0204-LA01	1332	<2.3	50.0
Blank	0204-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.3 VENTILATION SYSTEM EVALUATION

Not applicable to this operation.

3.4 NOISE MEASUREMENTS

Not applicable to this operation.

3.5 PERSONAL PROTECTIVE EQUIPMENT

Not applicable to this operation.

3.6 INTERPRETATION OF RESULTS

LEAD: All five surface wipe samples collected within the former firing range were found to contain lead dust levels which exceed the maximum limit set by the National Guard Bureau (NGB). URS recommends that an appropriately trained personnel clean the former firing range. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix F. Guidance for the cleaning and rehabilitation of indoor firing ranges is provided in Appendix H.

4.0 DRILL HALL

4.1 OPERATION DESCRIPTION

The drill hall is an 8,300 square foot area used for assembling personnel and storing equipment. The walls are constructed of brick with a wood floor.

4.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Acceptable Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Floor – Rear	0204-LW01	1.000	650	200
Drill Hall – Floor – Center	0204-LW02	1.000	81	200
Drill Hall – Floor – Front	0204-LW03	1.000	130	200
Drill Hall – Top of Coca Cola Machine	0204-LW04	1.000	1200	200
Drill Hall – Top of a Table	0204-LW05	1.000	43	200
Drill Hall – Top of a Locker	0204-LW06	1.000	840	200
Blank	0204-LWBlank	N/A	<12	200

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Drill Hall	0204-LA02	1332	<2.3	50.0
Blank	0204-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

One paint chip sample was collected from the wall where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration above the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 4-3 below shows the results of the lead paint testing.

Table 4-3
Level of Lead in Paint Found in the Drill Hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Drill Hall – Wall	0204-LPC11	0.01	25.0

The analytical report from AMA is contained in Appendix D.

4.3 VENTILATION SYSTEM EVALUATION

Not applicable to this operation.

4.4 NOISE MEASUREMENTS

Not applicable to this operation.

4.5 PERSONAL PROTECTIVE EQUIPMENT

Not applicable to this operation.

4.6 INTERPRETATION OF RESULTS

LEAD: Three of the five wipe samples collected for lead within the drill hall were found to contain a lead level exceeding the maximum limit set by the NGB. The entire drill hall including horizontal surfaces with accumulated dust should be cleaned by technicians trained in accordance with the OSHA lead standard (29 CFR 1910.1025) The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix F.

Analytical results from a paint chip collected from peeling cream colored paint (Photo #3555) indicates that the paint is "lead-based". URS recommends that the paint be stabilized and made intact by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025).

ASBESTOS: An exposed pipe fitting (Photo # 3557) and a split in the ACM pipe insulation (Photo # 3354) were discovered during the walk through inspection.

HOUSEKEEPING: An electrical box was blocked, restricting access (Photo # 3556)

5.0 BOILER ROOM / BASEMENT AREA

5.1 OPERATION DESCRIPTION

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping. The basement contains multiple storage rooms, bathrooms and electrical rooms.

5.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

5.2.1 Lead

Paint chips were collected where paint was peeling and sent to AMA for analysis. One sample (sample # 0204-LPC08) was found to contain lead in a concentration above the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 38	0204-LPC04	0.01	0.21
Boiler Room # 38	0204-LPC05	0.01	0.16
Basement Room # 34	0204-LPC06	0.01	0.19
Basement Room # 37	0204-LPC07	0.01	<0.01
Basement Room # 43	0204-LPC08	0.01	15
Garage # 52	0204-LPC09	0.01	0.2
Garage # 52	0127-LPC10	0.01	0.17

The analytical report from AMA is contained in Appendix D.

5.3 VENTILATION SYSTEM EVALUATION

Not applicable to this operation.

5.4 NOISE MEASUREMENTS

Not applicable to this operation.

5.5 PERSONAL PROTECTIVE EQUIPMENT

Not applicable to this operation.

5.6 INTERPRETATION OF RESULTS

LEAD: Analytical results from a paint chip collected from peeling aqua-blue colored paint (Photo #3555) indicates that the paint is "lead-based". URS recommends that the paint be stabilized and made intact by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025).

ASBESTOS: The boiler, pipefitting and pipe run insulation all have exposed sections. These materials were determined to contain asbestos in a concentration greater than one percent during a previous survey conducted by ATC Associates, Incorporated. It is recommended that the exposed sections (Photos # 3543-44) be removed or repaired. The work should be performed by an appropriately trained technician.

MOLD: There were water stains on the ceiling in room # 34 (Photo # 3545) and water damage to the ceiling in room # 49 (Photo # 3551, both of which could lead to mold problems if not addressed.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 CONFINED SPACES

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 HEARING CONSERVATION

The hearing conservation program was found in the safety book, under tab M, chapter 3. No training records were found on site. A hearing conservation program is not required for this site

6.3 RESPIRATORY PROTECTION

The respiratory protection program was found in the safety book, under tab M, chapter 3. No training records were found on site. A respiratory protection program is not required for this site.

6.4 HAZARD COMMUNICATION

The hazard communication program was found in the safety book, under tab L. An Operations and Maintenance Plan (O & M) was provided to URS before the inspection with regard to the asbestos on site. Key elements of the O & M plan such as labeling and training have not been implemented.

Material safety data sheets were available, however there was no chemical inventory on site.

6.5 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment program was found in the safety book, under tab N, chapter 10. No training records were found on site. A personal protective equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 55-2004: Thermal Environmental Conditions for Human Occupancy

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

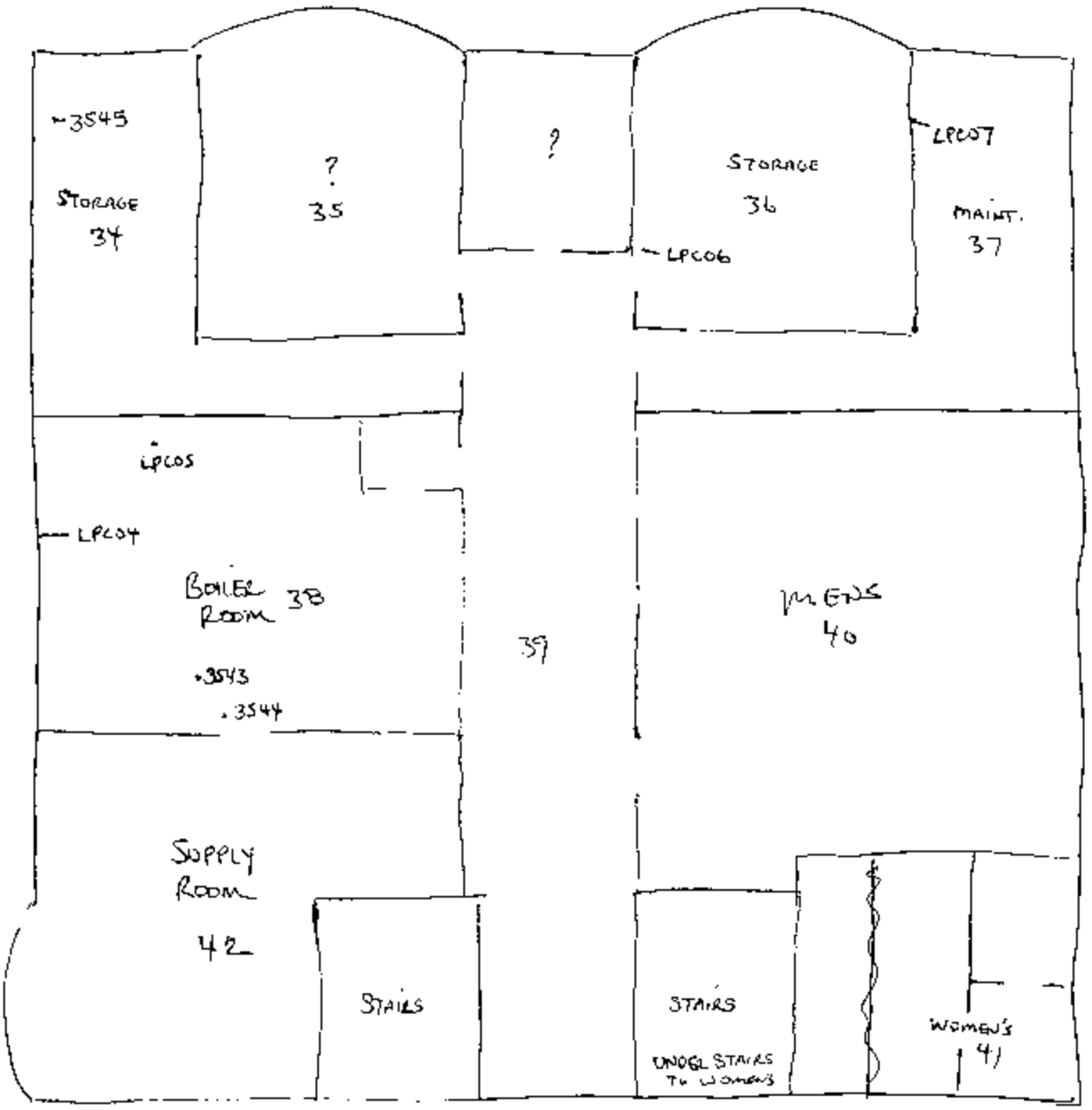
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

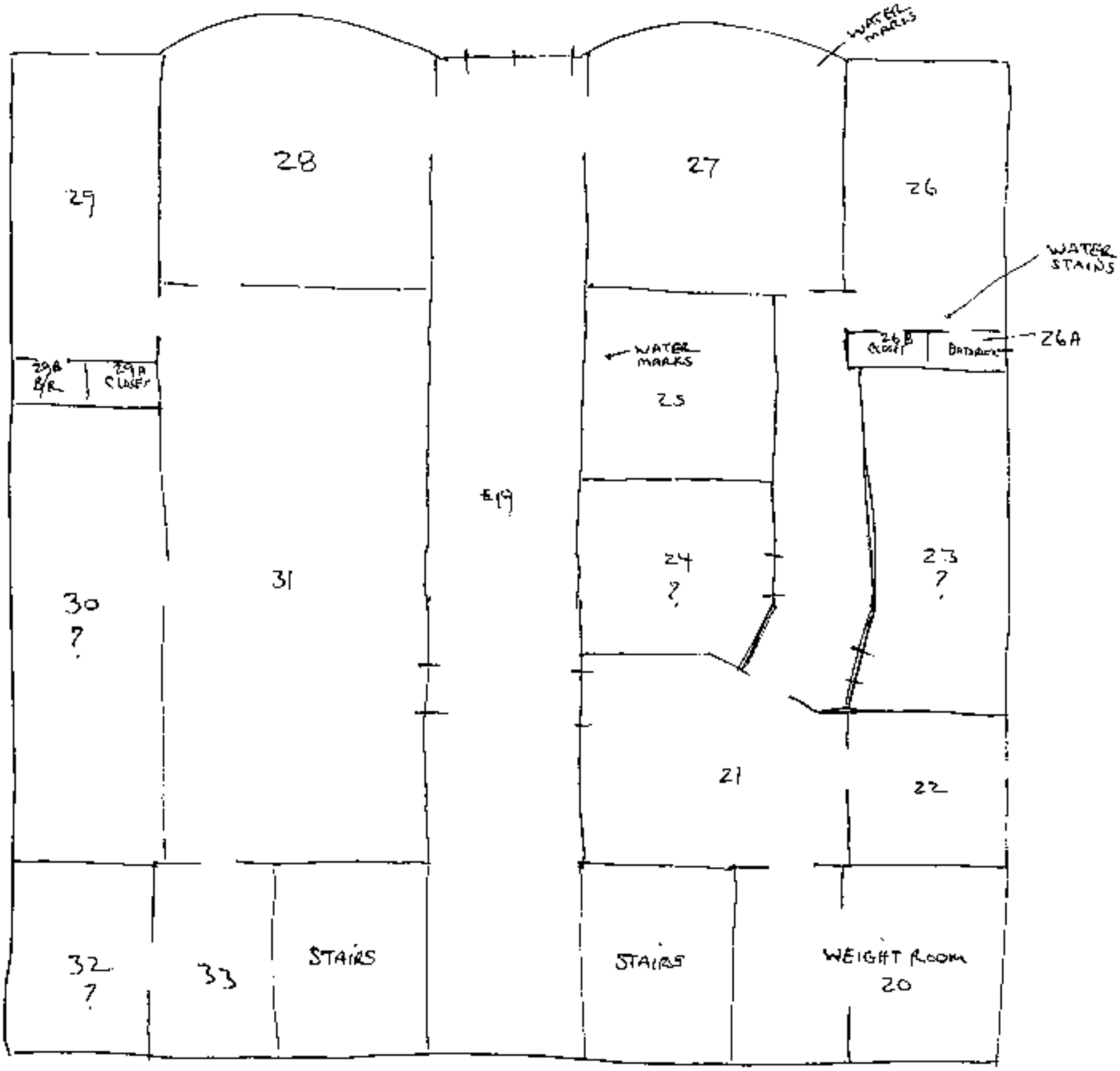
APPENDIX A

SHOP DRAWING

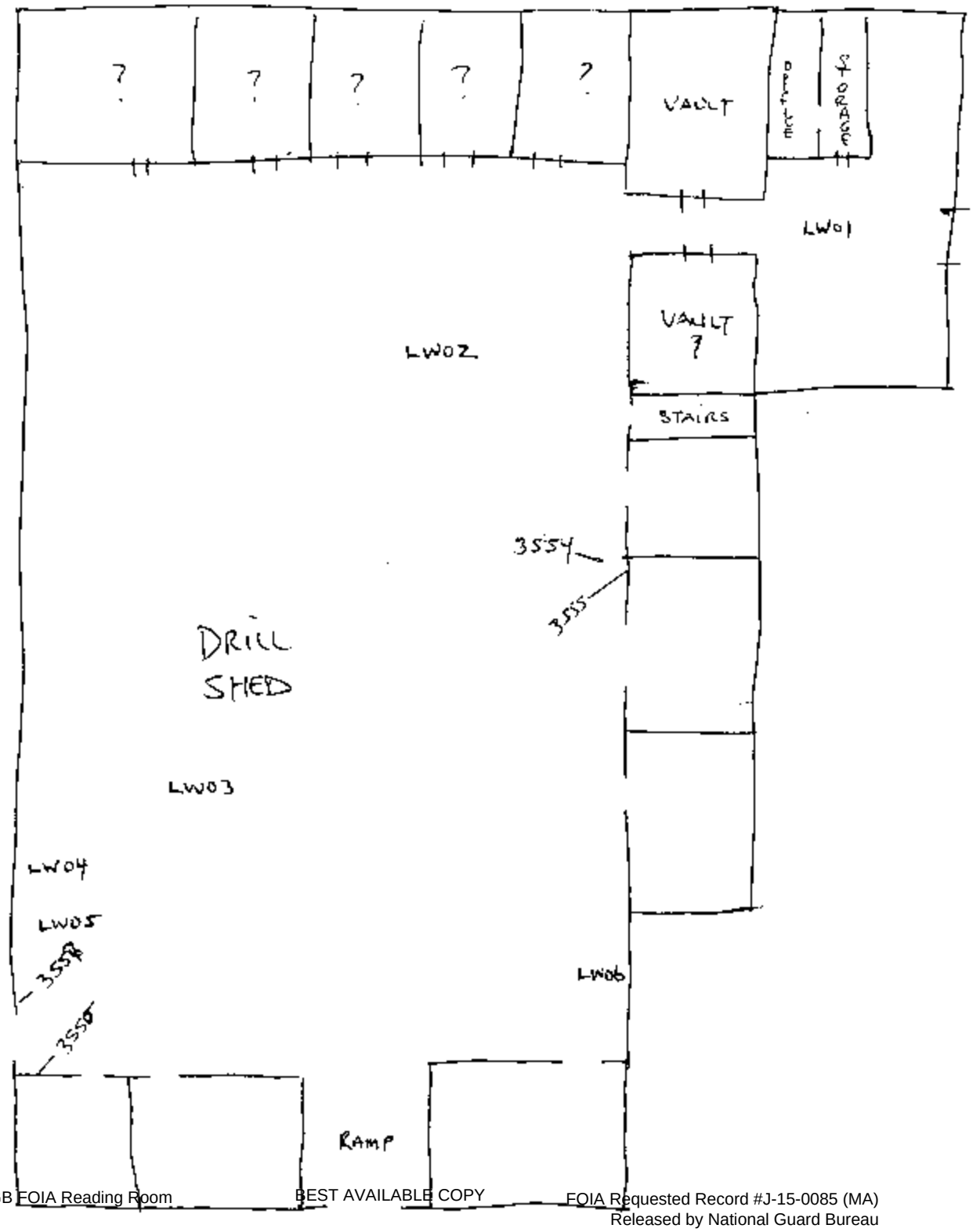
FRONT BASEMENT



FRONT
1ST FLOOR



1ST FLOOR LEVEL



NEW BEDFORD, MA

URS

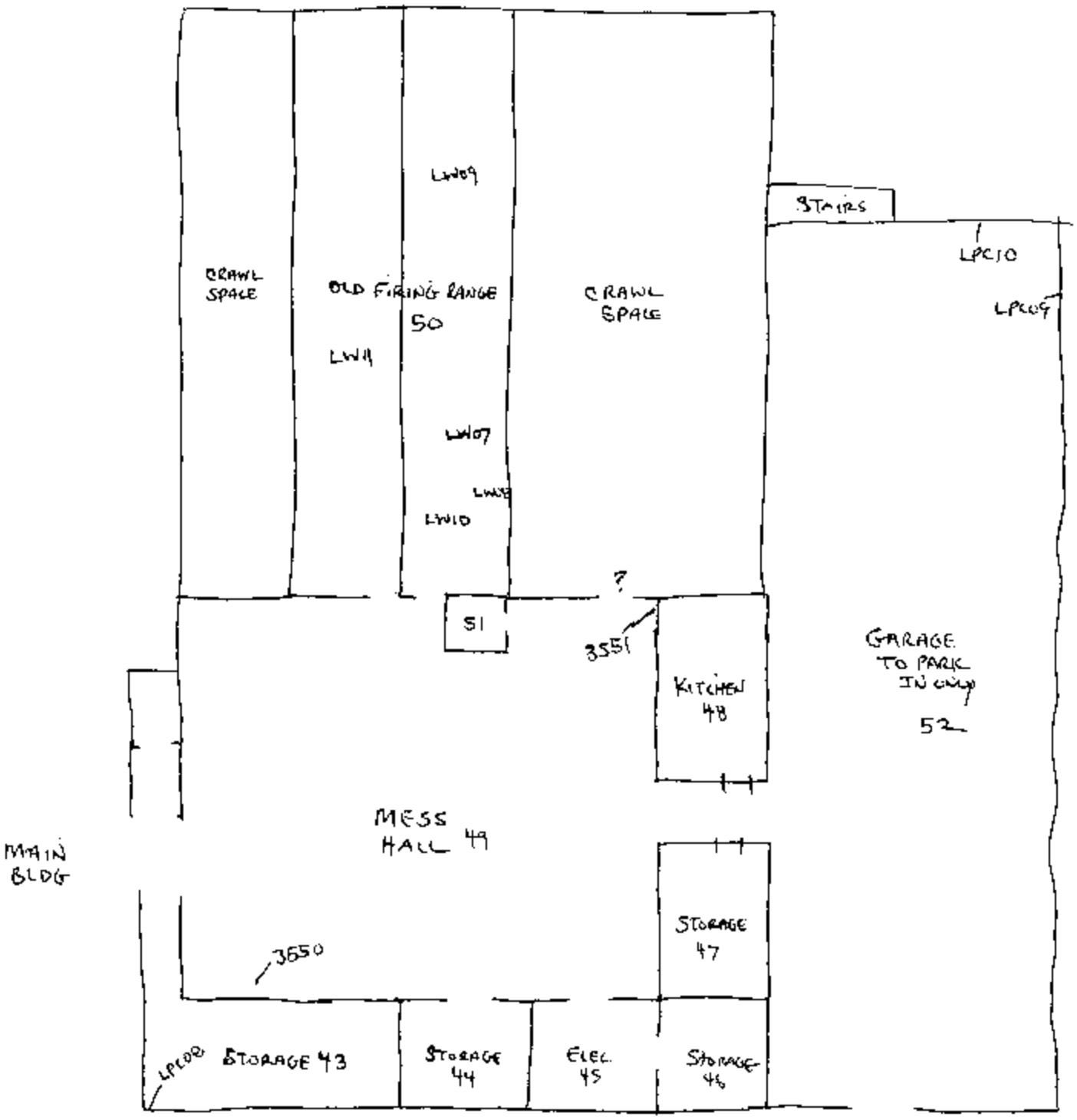
Page ____ of ____

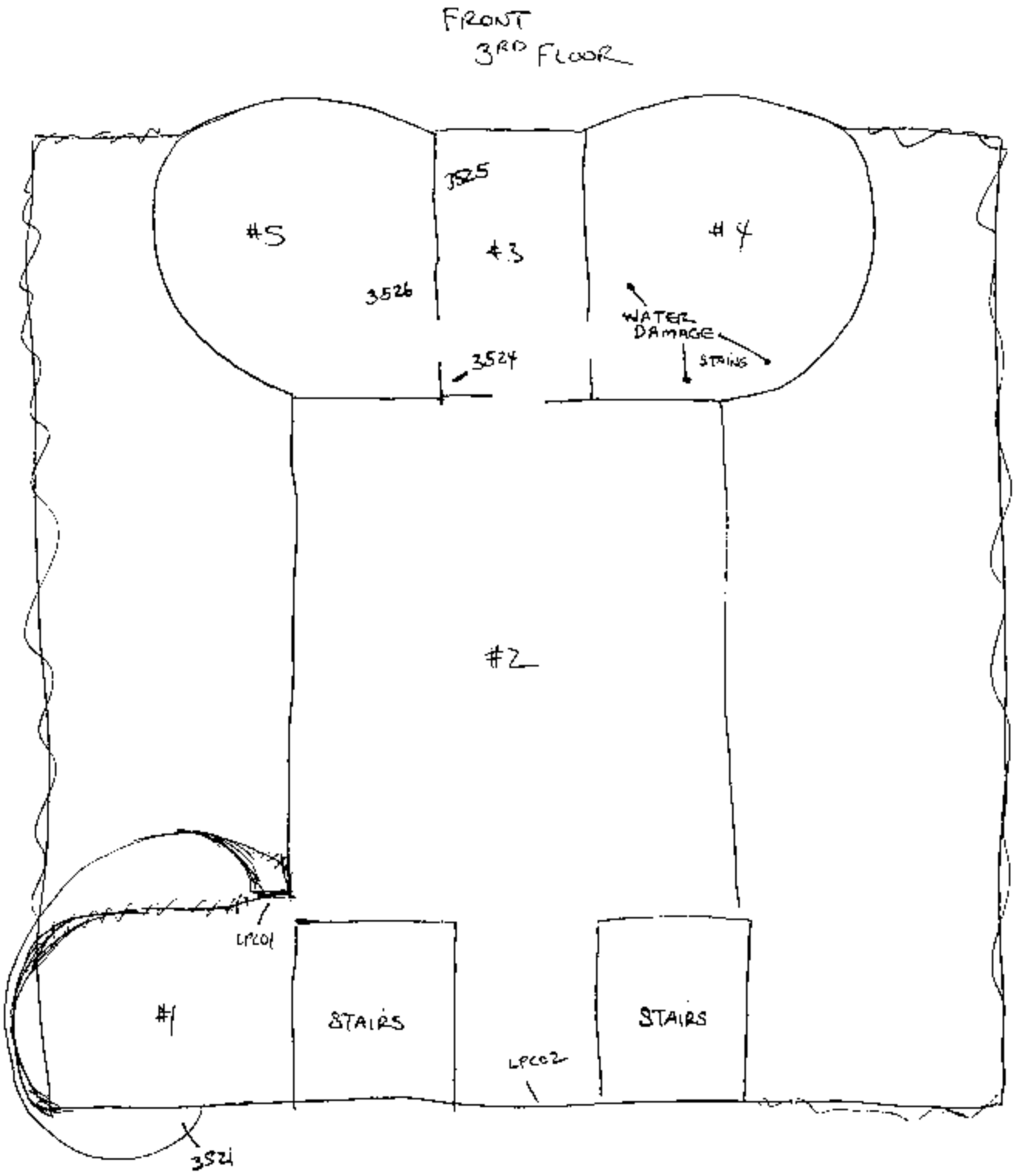
Job _____ Project No. _____ Sheet ____ of ____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference




FRONT
3RD FLOOR
#5
#3
#4
#2
#1
3525
3526
3524
3521
WATER DAMAGE
STAINS
STAIRS
STAIRS
LPC01
LPC02

APPENDIX B

PERSONNEL LIST

PERSONEL LIST
NEW BEDFORD ARMORY

Non-Responsive	Rank
	CAP
	CAP
	SFC
	SFC
	SFC
	SFC
	SFC
	SGT
	SSG

APPENDIX C

HAZARDOUS MATERIALS LIST

NOT AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122890
Address:	301-fII Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	5 Sycamore Street, New Bedford, MA	**Date Analyzed:**	02/11/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	18-Feb-04

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0424889	0204-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.11	%Pb	
0424890	0204-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	35	%Pb	
0424891	0204-LPC 03	Flame	Paint Chip	****	N/A	0.02	%Pb	0.025	%Pb	
0424892	0204-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	0.21	%Pb	
0424893	0204-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.16	%Pb	
0424894	0204-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.19	%Pb	
0424895	0204-LPC 07	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.01	%Pb	
0424896	0204-LPC 08	Flame	Paint Chip	****	N/A	0.01	%Pb	15	%Pb	
0424897	0204-LPC 09	Flame	Paint Chip	****	N/A	0.01	%Pb	0.2	%Pb	
0424898	0204-LPC 10	Flame	Paint Chip	****	N/A	0.01	%Pb	0.17	%Pb	
0424899	0204-LPC 11	Flame	Paint Chip	****	N/A	0.01	%Pb	25	%Pb	
0424900	0204-LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²	650	ug/ft²	
0424901	0204-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²	81	ug/ft²	
0424902	0204-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²	130	ug/ft²	
0424903	0204-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²	1200	ug/ft²	
0424904	0204-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²	43	ug/ft²	
0424905	0204-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²	840	ug/ft²	
0424906	0204-LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²	1900	ug/ft²	
0424907	0204-LW 08	Flame	Wipe	****	1.000	12.00	ug/ft²	590	ug/ft²	
0424908	0204-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²	1800	ug/ft²	

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122890
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	5 Sycamore Street, New Bedford, MA	**Date Analyzed:**	02/11/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	18-Feb-04
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0424909	0204-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft^2	510	ug/ft^2	
0424910	0204-LW 11	Flame	Wipe	****	1.000	12.00	ug/ft^2	2200	ug/ft^2	
0424911	0204-LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0424912	0204-LA 01	Flame	Air	1332	N/A	2.25	ug/m^3	< 2.3	ug/m^3	
0424913	0204-LA 02	Flame	Air	1332	N/A	2.25	ug/m^3	< 2.3	ug/m^3	
0424914	0204-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m^3	< 3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] **Technical Manager:** [redacted]

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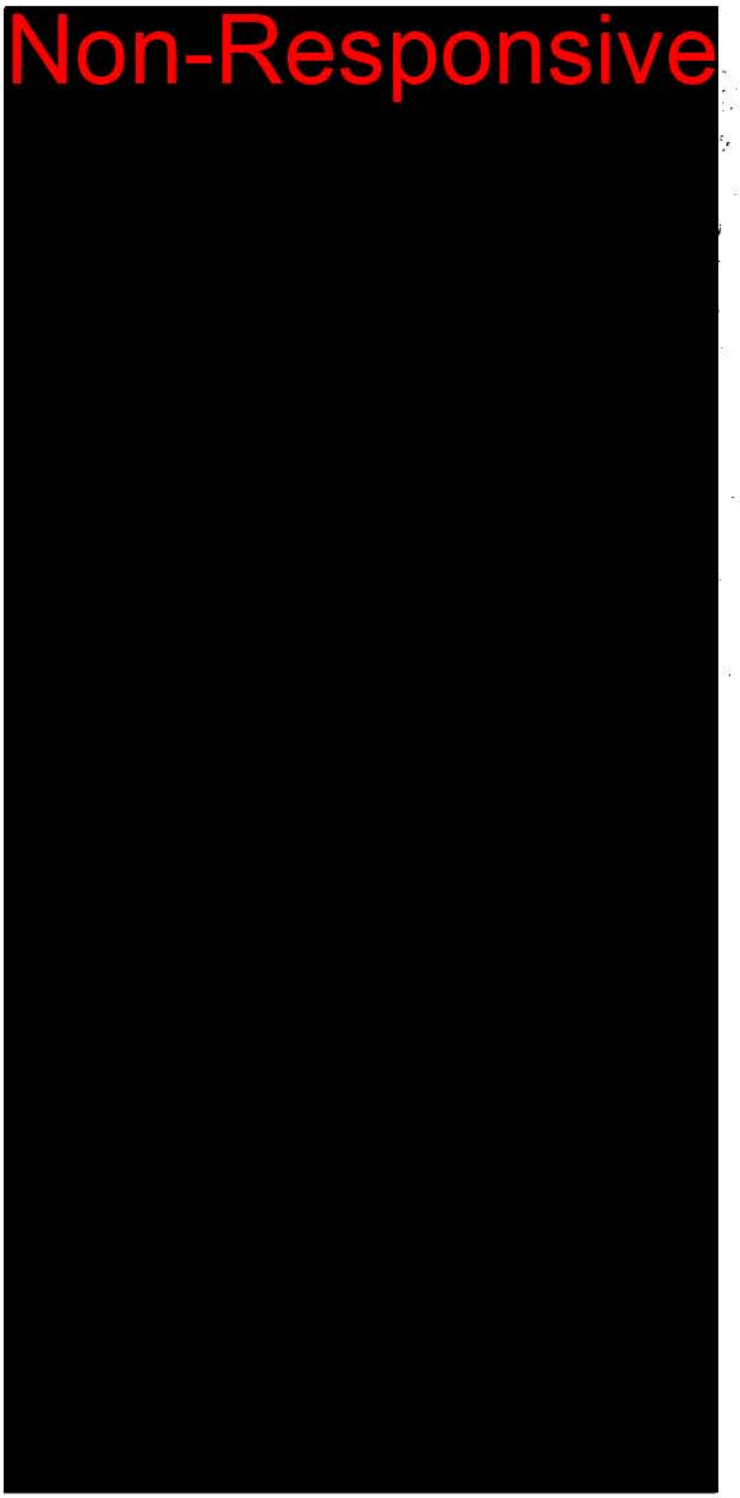
APPENDIX E

TRAINING CERTIFICATES


Non-Responsive

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
President/Director of Training

APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft^2) and windowsills (250 µg/ft^2) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 µg/ft^2 on floors and 250 µg/ft^2 on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

APPENDIX G

PHOTOGRAPHS

Photo 3521: 3rd Floor Room #1 -- Water damage

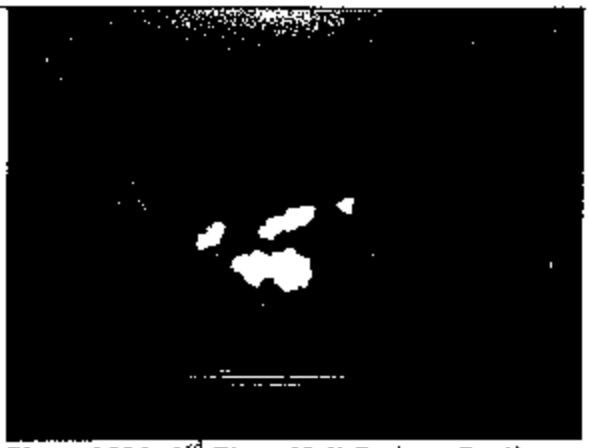


Photo 3523: 3rd Floor Hall Stairs Peeling lead-based paint

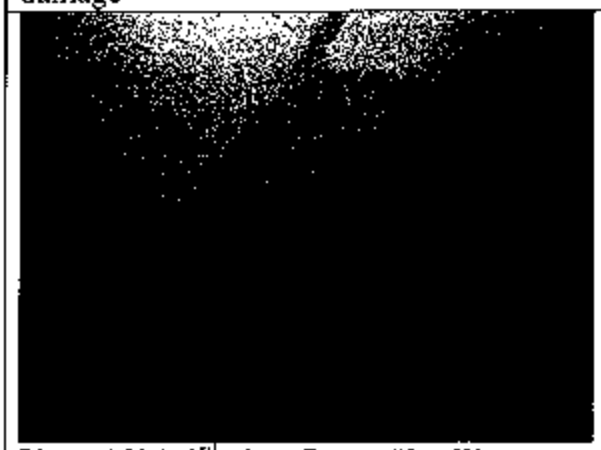


Photo 3524: 3rd Floor Room #3 Water Damage

Photo 3525: 3rd Floor Room #3 - Leaking roof

Photo 3526: 3rd Floor Room #5 – Water damage

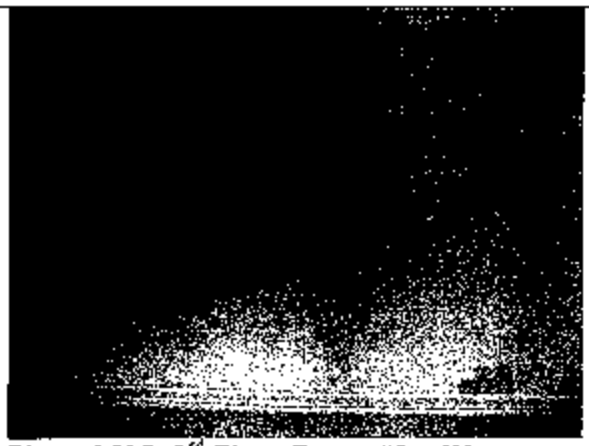


Photo 3527: 3rd Floor Room #2 - Water damage

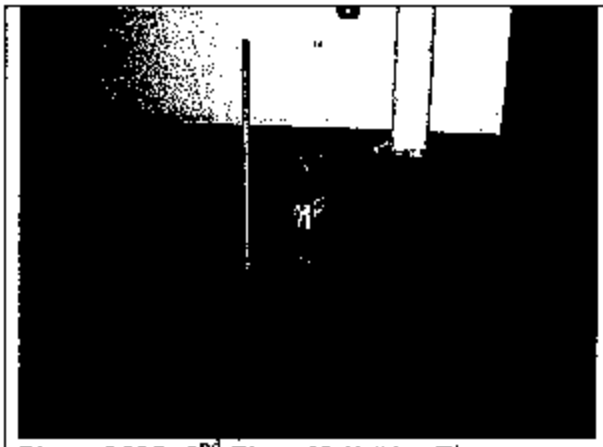


Photo 3528: 2nd Floor Hall #6 – Fire extinguisher hidden, unmarked and last inspected in 2002

Photo 3529: 2nd Floor Room #10 Water Damage

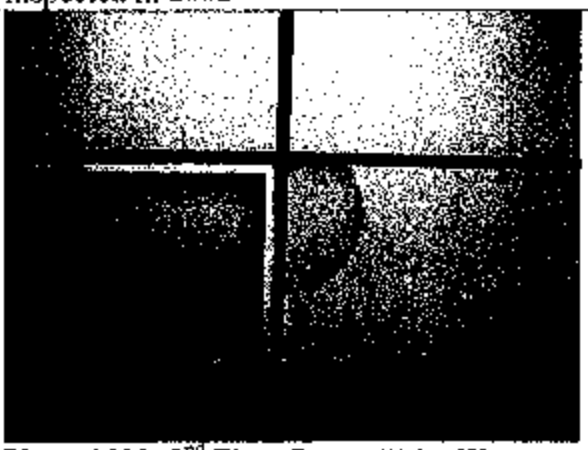


Photo 3530: 2nd Floor Room #16 · Water Damage

Photo 3531: 2nd Floor Room #17 Water Damage

Photo 3533: 2nd Floor Room #12 – Water damage

Photo 3534: 2nd Floor Room #7 – Water damage

Photo 3536: 1st Floor Bathroom #26 – Water damage

Photo 3537: 1st Floor Bathroom #26 Water damage

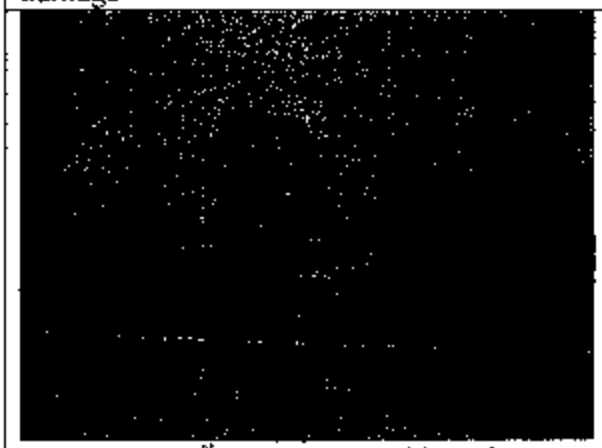


Photo 3540: 1st Floor Room #23 – Water damage

Photo 3543: Basement Boiler Room – Exposed asbestos-containing boiler insulation

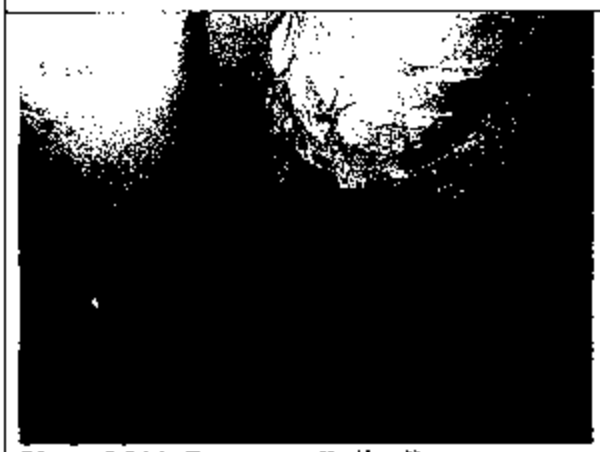


Photo 3544: Basement Boiler Room – Damaged asbestos-containing pipe insulation

Photo 3545: Basement Room #34 – Water staining

Photo 3549: Basement Room #43 Lead-based aqua-blue paint peeling on wall

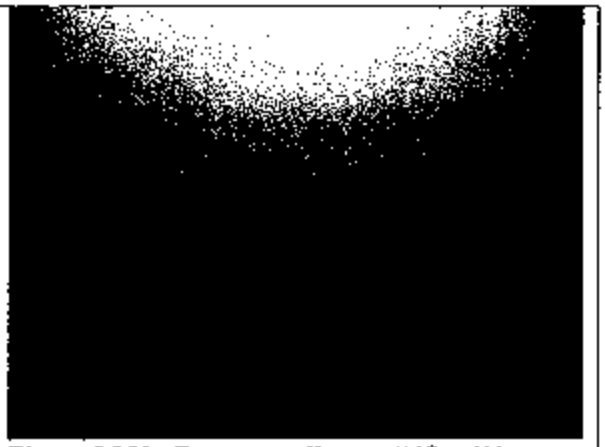


Photo 3551: Basement Room #49 – Water damage on ceiling

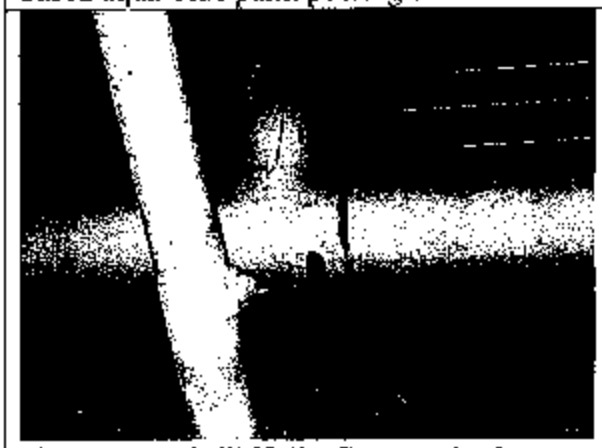


Photo 3554: Drill Hall Damaged asbestos-containing pipe insulation

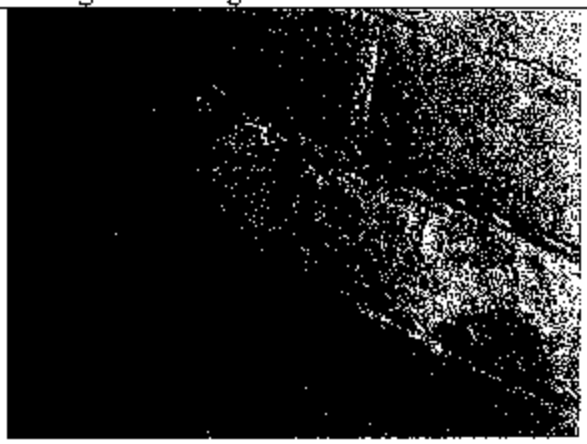


Photo 3555: Drill Hall – Lead-based cream paint peeling on wall

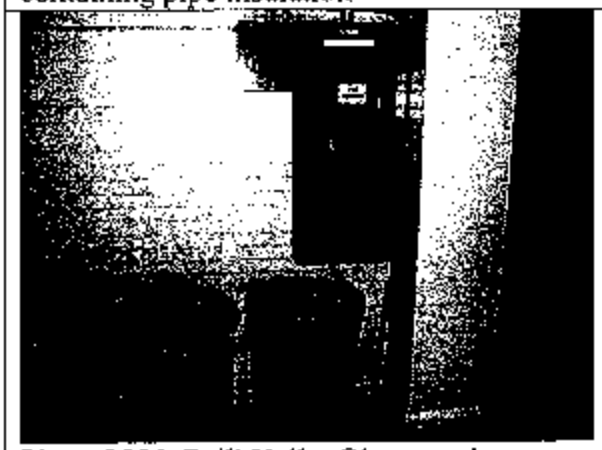


Photo 3556: Drill Hall – Obstructed electrical panel

Photo 3557: Drill Hall – Damaged asbestos-containing pipe insulation

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

NGB-AVS

5 December 2001

MEMORANDUM FOR THE ADJUTANTS GENERAL OF ALL STATES, PUERTO RICO, THE US VIRGIN ISLANDS, GUAM, AND THE COMMANDING GENERAL OF THE DISTRICT OF COLUMBIA

SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

1. References:

a. AR 385-63, Policy and Procedures, 15 November 1983.

b. DODI 6055.9-STD, DOD Ammunition and Explosive Safety Standards, August 1997.

c. DODIG Report #98-170, subject: ARNG and U.S. Army Reserve Command Small Arms IFR, 30 June 1998.

d. AR 385-10, The Army Safety Program, 29 February 2000.

e. All States Memorandum, NGB-AVS, 18 September 2000, subject: (All States Log Number P00-0059) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges.

2. The policy and procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges are enclosed. Guidelines for Rehabilitation, Conversion, and Cleaning of IFRs are provided in the Addendum. These policies apply to all persons responsible for the operation, rehabilitation, conversion, and cleaning of ARNG IFR and satisfy the requirements of the references listed above.

3. The enclosed document contains sample formats of the forms necessary for the routine operation of IFRs. Additionally, an IFR Standing Operating Procedure is provided to assist each State/Territory in developing local guidance consistent with the needs of the individuals that use their range(s).

4. The contents of this memorandum will be incorporated into the revision of NGR 385-15, Policy and Responsibilities for Evaluation, and Operation of ARNG Indoor Firing Ranges, and National Guard Pamphlet 385-15, Guidance and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

NGB-AVS
SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning Inspection

5. This memorandum expires 30 November 2002, unless sooner rescinded or superseded.

6. Point of contact is Colonel Non-Responsive Chief, Aviation and Safety Division, at DSN 327-7700 or 703-607-7700.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

Non-Responsive

Encl
as

Lieutenant General, GS
Director, Army National Guard

CF:
NGB-IG
NGB-ART
NGB-ARO
NGB-ARE
NGB-ARI
NGB-ARS
NGB-PL
NGB-ARZ-PC
Each State IG
Each State Safety Office
Each State Occupational Health Nurse
Each State Training Site Commander
Each State USPFO
Each Regional Industrial Hygienist

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Contents

Appendices
- Appendix A - Abbreviations
- Appendix B - References
- Appendix C - Indoor Firing Range Accident Response Plan
- Appendix D - Permission and Release of Liability Certificate

Addendum
- Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning

1-1. General
This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

1-2. Explanation of abbreviations and terms
Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

1-3. Policy
a. Ammunition shall only be fired in properly classified indoor firing ranges.
b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
f. New ranges shall be designed using the latest standards provided by NGB-ARI.
g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

Responsibilities

1-4. Director, Army National Guard (DARNG)
The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

1-5. Chief, Aviation and Safety (NGB-AVS)
The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:
a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
b. Coordinate with other HODA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall--
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

1-7. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-8. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall- -

a. Provide the design standards for the construction of indoor firing ranges.

b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

1-9. The State Adjutant General
The State Adjutant General shall- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.

c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

1-10. State Safety Manager
State Safety Managers shall--

a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.

b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.

c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.

d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.

e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

f. Approve the use of the range by non-military organizations.

g. Maintain copies of all range inspections, ventilation measurements and visitors log.

1-11. State Occupational Health Nurse
The Occupational Health Nurse shall- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.

b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.

d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

1-12. State Environmental Office
The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

1-13. Facility Commanders
Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.

b. Indoor firing ranges are secured when not in use.

c. A custodian is appointed for all indoor firing ranges under his/her area of command.

d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.

e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.

f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.

g. All required signs are posted IAW Section 1-22 of this regulation.

h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.

i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).

j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.

k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.

m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.

n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).

o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter (mg/m^3).

p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.

q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.

r. The ventilation system is in operation at all times during firing or cleaning.

1-14. Range Custodians
Custodians shall- -

a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.

b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

1-15. Unit Commanders

Unit Commanders shall- -

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using **"limited use"** firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as **"limited use"** ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

1-16. Procedures, classification and use

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

1-17. Classification of ranges

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as **"safe"**, **"limited use"** or **"unsafe"**. **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for Intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in DG 415-1, Appendix A or CEHND 1110-1-18).

(1) **Safe ranges.**

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

(2) **Unsafe ranges.**

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

b. **Ventilation**

(1) **Safe ranges.**

(a) The range has an operational mechanical ventilation system.

(b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).

(c) Air is exhausted at or behind the bullet trap.

(d) Supplied air is introduced into the range behind the shooters.

(e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.

(f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.

(h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of water gauge (wg) but does not exceed -.20 wg.

(i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)

(j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.

(k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

(2) **Unsafe ranges.**

(a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.

(b) The range has no mechanical ventilation.

(c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.

(d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.

(e) Air is exhausted anywhere other than at the bullet trap.

(f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.

(g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -. 05 wg or in excess of -. 2 wg.

(h) The range is under positive pressure.

(i) The supply and exhaust air systems are not electrically interlocked.

c. **Range lighting.**

(1) **Safe ranges.**

(a) Lighting is uniform, non-glaring and does not cause shadows.

(b) Illumination is at least 100 foot candles on the targets and 30 foot- candles in all other areas.

(c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.

(d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.

(e) Emergency lights are provided behind the firing line and are in working condition.

(f) Exit lights are provided as required.

(g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

(2) **Unsafe ranges.**

(a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. **Bullet traps.**

(1) Safe ranges.

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.

(c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

(2) Unsafe ranges.

(a) Steel bullet traps are bowed, punctured or severely pitted.

(b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

e. **Targets and target carriers.**

(1) Safe ranges.

(a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).

(b) Only paper targets are used.

(2) Unsafe ranges. Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

f. **Lead levels.**

(1) Safe ranges.

(a) For personnel exposed less than 30 days per year, Lead levels do not exceed 0.05 mg/m^3.

(b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed 0.03 mg/m^3.

(c) For personnel under the age of 18, see Figure 1-1.

(2) Limited use ranges.

(a) For personnel exposed less than 30 days per year, Lead levels exceed 0.05 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed 0.03 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample.

(3) Unsafe ranges.

Lead levels in air sample results exceed 0.4 mg/m^3 in any breathing zone or general area sample.

1-18. Range use

a. Indoor firing ranges shall not be used for any purpose other than firing. (I.e., they shall not be used for classrooms, exercise rooms, storage, etc.).

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

1-19. Prohibitions

a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.

c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.

d. Variable speed fans are *not* permitted.

e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.

f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.

g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.

h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.

i. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.

j. There are no open floor drains in the range.

k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

1-20. Personal protective equipment

a. **Eye protection**. All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection.

b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.

c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

1-21. Posting warning signs

a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:

(1) Eating, Drinking and Smoking are *prohibited*

(2) Dry Sweeping is *prohibited*

(3) Wash Hands and Face Immediately Following Firing

(4) Only the Following Ammunition is *authorized* for use on this Range: _____

(5) Hearing Protection *shall be* properly worn during firing

(6) Proper Safety Glasses/Goggles *shall be* worn during firing

(7) Furniture or storage of other items of equipment is *not* permitted in the range

b. The following signs shall be posted on the entrance door to the range:

(1) Noise Hazardous Area

(2) Danger Lead Hazard Area

(3) Pregnant women are *not* permitted in this area.

c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.

e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

Note: All signs shall meet the requirements of DA Pam 385-64.

1-22. Range Standing Operating Procedures.

a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

(a) Name and age of shooter.

(b) Organizations (if civilian, include address and phone number).

(c) Sign-in and sign-out times and date.

(d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

1-23. Inspection requirements.

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

1-24. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

1-25. Annual inspections

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

1-26. Ventilation requirements

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

1-27. Air sampling requirements

a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m^3 sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(il).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

1-28. Inspection reports

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

1-29. Record maintenance

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

1-30. Control of potential Lead intoxication

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

(1) A description of each operation where Lead is emitted;
(2) Methods used to achieve compliance;
(3) Methods used to meet the permissible exposure level;
(4) Air monitoring data, which documents the source of air emissions;
(5) A detailed schedule for implementation of the program;
(6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
(7) Administrative control schedule;
(8) Personnel enrollment in medical surveillance;
(9) Other relevant information.

b. Refer to TG 206 for specific guidance on developing the compliance program.

1-31. Alternative ammunition

a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

1-32. Maintenance requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline static pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

(5) Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

1-33. Housekeeping

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are ¾ full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

1-34. Maximum exposure hours
Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m^3 or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed 0.03 mg/m^3. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

1-35. Extent of use
a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m^3. For ranges with Lead concentrations less than 0.100 mg/m^3, follow the guidelines in Figure 1-1.
d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

1-36. Medical surveillance
a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m^3) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

1-37. Terms
a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

FIGURE 1-1

0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 – 0.499	0.75	0.5	0
0.500 – 0.749	0.5	0.25	0
0.750 – 0.999	0.25	0.25	0
1.000 or above	0	0	0

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range _____ Date _____

Range Custodian _____ Telephone _____

Part 1, Physical Safety Inspection

A. Building Envelope

_____ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]

_____ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17e(1)(d)]

_____ 4. There are no open floor drains in the range. [1-17a(2)(c)]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]

_____ 7. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]

_____ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]

_____ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))

_____ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))

_____ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))

_____ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]

_____ 6. Exit lights are provided and working as required. [1-17c(1)(f)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-AR, the Addendum, and this regulation. [1-17d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]

_____ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]
(Any one firing lane without a retrieval system shall not be used for firing)

_____ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]

_____ 3. Only paper targets are used in the range. [1-17e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [1-18a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]

_____ 3. No additional clothing or equipment is brought into the range. [1-19h]

_____ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-19a]

_____ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]

_____ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]

_____ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

F. Range maintenance

_____ 1. Dry sweeping does not occur in the range. [1-19e]

_____ 2. No brooms are located in the range. [1-19e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
- _____ a. Eating, Drinking and Smoking are *Prohibited*
- _____ b. Dry Sweeping is *Prohibited*
- _____ c. Wash Hands and Face Immediately Following Firing
- _____ d. The Following Ammunition is authorized for use on this Range: _____
- _____ e. Hearing Protection *shall be* Properly worn during firing
- _____ f. Proper Safety Glasses/Goggles *shall be* worn during firing
- _____ g. No Furniture or Storage of Items Permitted in the Range

_____ 2. The following signs are posted on the entrance door to the range: [1-21b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant women are *not* permitted in this Area

_____ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters. [1-21c]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

_____ 2. The range SOP includes as a minimum the following: [1-22b]

_____ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

_____ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

_____ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

_____ d. Instructive guidance for all range procedures.

_____ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

_____ f. Authorized ammunition for the range.

_____ g. The requirement for posting of signs IAW section 1-21 of this regulation.

_____ h. Cleaning and maintenance requirements.

_____ i. Personal protective equipment requirements for maintenance, firing and cleaning.

J. Recordkeeping

_____ 1. A visitors log is maintained which includes the following information for all visitors/shooters: [1-14c]

_____ a. Name and age of shooter.

_____ b. Organization (if civilian, include address and phone number).

_____ c. Sign in and sign out times.

_____ d. Type of ammunition used and number of rounds fired.

_____ 2. Copies of initial and other previous inspections are available. [1-24a]

_____ 3. The initial inspection report includes air-sampling data. [1-24b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

_____ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

_____ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

_____ 7. Range safety officer(s) is/are designated. [1-13c]

K. New and Renovated Ranges

_____ 1. No doors are installed in the plenum wall.

_____ 2. Plenum area is at least 4 feet deep.

_____ 3. An access door is installed behind the bullet trap.

_____ 4. Only escalator or rubber bullet traps are installed.

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INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 2, Ventilation Inspection

A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]

_____ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]

_____ 4. Make-up air is introduced into the range behind the shooters. [1-17b(1)(d)]

_____ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [1-17b(1)(e)]

_____ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [1-17b(1)(f)]

_____ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]

_____ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]

_____ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii)]

_____ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails.
[29 CFR 1910.1025(e)(4)(ii)]

_____ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, 3-2a]

_____ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]

_____ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]

_____ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]

_____ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

B. New and Renovated Ranges

_____ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.

_____ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.

_____ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 4. Passive supply systems have opposing blade louvers.

_____ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____

2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____

3. Air sampling has been scheduled for: _____

Print and sign: _____

Position: _____ Date: _____

4. Air sampling was completed on: _____ for the following types of ammunition: _____.

5. Air sample results do not exceed: _____ mg/m^3 (results are attached)

6. For military personnel exposed less than 30 days per year, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

Print and sign: _____

Position: _____ Date: _____

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FIGURE 1-3
EXAMPLE OF INDOOR FIRING RANGE SOP
STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXXX
_____ ARMORY INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

1. **References:**

a. AR 385-10
b. AR 385-63
c. NGR 385-10
d. NG PAM 385-XX
e. 29 CFR 1910.1025
f. 29 CFR 1920.1200
g. 29 CFR 1926
h. 29 CFR 1960
I. USACHPPM, TG 141

2. **Purpose.** The _____ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

3. **Review and Update.** This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

4. **General.**

a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.

b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

5. **Range Control.**

a. The _____ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

(1) Enforce the facility range safety program and SOP.

(2) Notify Armory personnel of times when the range shall be in use.

(3) Coordinate and schedule all activity on the firing range.

(4) Ensure that the range is secured when not in use.

(5) Ensure that nothing is stored at the range.

(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Sate Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCOIC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (**Appendix C** of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paragraph 1-21 are posted as required.

6. **Range OIC/NCIOC.** The Commander or supervisor of all using units or groups shall designate an OIC/NCOIC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range have singed-in on the roster maintained by the facility Commander.

(10) Ensure that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from _____ to _____ hours.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.

(3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.

(4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.

(5) Ensure that weapons are cleared and checked during temporary suspension of firing.

(6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

c. After Firing.

(1) Ensure that all weapons are cleared prior to being removed from the firing line.

(2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

(3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**

(4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

7. **Range Control Officer Qualifications.** His or her commander may appoint any individual in the rank of E-6 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

8. **Range Restrictions.**

a. The _____ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

EXAMPLE

(1) .22 caliber including the M-16 with adapter
(2) .38 caliber
(3) .45 caliber
(4) 9 mm pistols

Note: No other weapons can be fired without the approval of the State Safety Manager.

b. Pellets, BBs, magnum and armor piercing rounds are prohibited.

c. Dry sweeping of the range is prohibited.

d. Trick shooting including, quick draw and hip shooting is prohibited.

e. Storage of any item in the range is prohibited.

f. Smoking and consumption of food or beverages is prohibited.

g. Proper hearing and eye protection shall be worn during firing.

h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.

i. Personnel shall not be allowed in the observation/plenum area during firing.

9. **Mandatory Signs**. As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

(1) Eating, drinking and/or smoking are prohibited.

(2) Dry sweeping is prohibited.

(3) Wash hands and face immediately after firing.

(4) Hearing protection shall be worn during firing.

(5) Safety glasses/goggles shall be worn during firing.

(6) Storage of furniture and other items is prohibited.

(7) The following ammunition is authorized for this range: _____, _____, _____, and _____.

b. On the Door to the Range.

(1) Noise Hazardous Area.

(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

10. Authorized Use of the Range. Utilization of the _____ Armory range is authorized for organizations of the _____ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of _____.

11. Release of Liability.

a. The military Range Control Officer shall obtain a signed Release of Liability (**Appendix D** of this SOP) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (**Appendix D** of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

12. Denial of Range Access. The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe
CPT, IN, ___ARNG
OIC/Armory Commander

APPENDIX A
ABBREVIATIONS

ANSI
American National Standards Institute

AR
Army Regulation

ARNG
Army National Guard

CFM
Cubic feet per minute

CFR
Code of Federal Regulations

CNGB
Chief, National Guard Bureau

DA
Department of the Army

FPM
Feet Per Minute

HEPA
High Efficiency Particulate Air

IAW
In Accordance With

IFR
Indoor Firing Range

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standing Operating Procedure

SP
Static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

wg
Inches of water gauge

APPENDIX B
REFERENCES

ACGIH 22nd Ed, Industrial Ventilation
A Manual of Recommended Practice

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 350-41
Army Forces Training

AR 385-63
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64
U.S. Army Explosives Safety Program

Army National Guard (ARNG) Design Guide (DG) 415-1
Design Guide for Armories

American National Standards Institute (ANSI) Z87.1-1999
Practice for Occupational and Educational Eye and Face Protection

CEHND 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

Department of the Army Pamphlet (DA PAM) 385-64
U.S. Army Explosives Safety Program

DA PAM 40-501
Hearing Conservation

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges

FM 25-7
Training Ranges

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development

APPENDIX B (Continued)

GR 420-10
Operations/Maintenance and Minor Construction, Army National Guard

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TG 206
USACHPPM Technical Guide for Indoor Firing Ranges

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910
Occupational Safety and health Standards

APPENDIX C
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. All weapons shall be cleared and muzzles pointed downrange.

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. The primary telephone to be used in case of an emergency is located _____. The emergency numbers are _____.

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN _____, or the duty officer, and the State Safety and Occupational Health Office at DSN _____.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

APPENDIX D
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

_____ ARNG
Somewhere, USA
Date: _____

BE IT KNOWN TO ALL: WHEREBY I, _____;
Have been granted permission to use firearms on the indoor firing range located at the _____ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of ____ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of ____, the ____ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of ____, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: _____

Witness to Signature: _____

In case of emergency, please contact:
Name _____
Address _____
_____
Telephone Number _____

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.
I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: _____

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References

Related publications are listed below.

a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (PREFERRED METHOD)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

[redacted]

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (if necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have overesprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

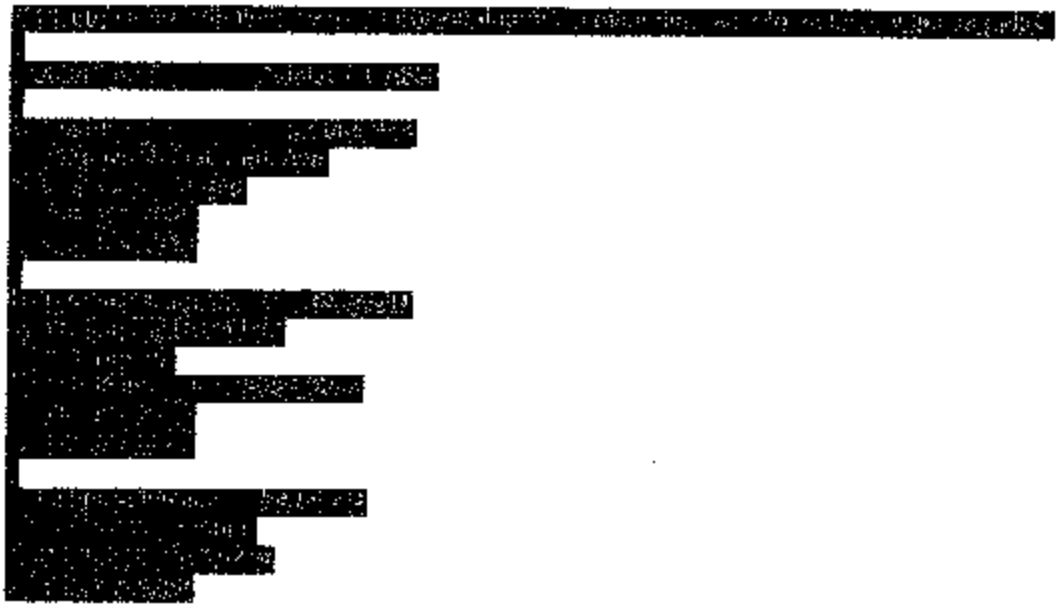
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 millliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address	Point of Contact *(name & phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	Date Collected	Date Shipped

Analysis Desired

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
NEWBURYPORT ARMORY
59 LOW STREET
NEWBURYPORT, MASSACHUSETTS

September 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Todd Young
Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Asbestos		
Damaged pipe insulation containing greater than 1% asbestos was present in this facility.	Remove and replace damaged asbestos-containing materials. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site specific asbestos operations and maintenance plan available, however there were no training records available and labeling of installed asbestos-containing materials has not been completed.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j)	RAC 3
Mold		
Water damaged and mold was observed throughout	Determine and repair source of water. Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Lead		
Lead was detected in wipe samples collected from the firing range and the drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3

FINDINGS AND RECOMMENDATIONS (Cont)

Findings	Recommendation	Risk Assessment Code
Fire Safety		
An emergency exit sign was not illuminated in the drill hall.	Each exit sign must be illuminated to a surface value of at least five foot candles by a reliable light source and be a distinctive in color (OSHA 29 CFR 1910.37(b)(6))	RAC 2
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Electrical Safety		
Electrical panels obstructed by equipment in` rooms #28 and #17.	Electrical panels must be kept clear of obstructions for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i)).	RAC 5

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Newburyport Armory located at 59 Low Street in Newburyport, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On November 21, 2003 Mr. Non-Responsive and Mr. Non-Responsive, industrial hygienists with URS, conducted a site visit to the Newburyport Armory in Newburyport, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. The point of contact for this site survey was SFC Non-Responsive

A drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Computer workstation chairs and armrests were in a fixed position and keyboards could not be adjusted. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints concerning ergonomics were voiced during URS' visit.

Water marks and damage to the ceilings and/or walls were observed throughout the facility. Mold growth was observed in Room 17 (Photos # 2632 – 2634).

Housekeeping in general was adequate with the exception of blocked electrical panels in room #28 and the classroom #17.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 35.9 – 41.5% with an average of 39.1%. These readings were below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Armory. Carbon dioxide concentrations ranged from 477 to 724 parts per million (ppm), with an average of 536 ppm. Carbon dioxide levels were measured using a direct-reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. An outside reading was not made since the average interior carbon dioxide level was below 700 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Armory. Carbon monoxide concentrations remained below detectable limits throughout the survey period, below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the

recommended lighting requirement ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (foot candles)	Recommended Minimum Illuminance (foot candles)
Office #2	Administrative Duties	33	50
Office #28	Administrative Duties	13	50
Office #3	Administrative Duties	19	50
Office #4	Administrative Duties	31	50
Office #8	Administrative Duties	14	50
Kitchen	Break	33	30

On the day of the survey the illuminance in the administrative area was inadequate in each of the offices tested and adequate in the kitchen.

2.2.5 Lead

Three paint chips were collected where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. Each paint chip was found to contain lead in a concentration below the allowable limit of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room 17	PC-1	0.01	0.11
Janitor Closet #17	PC-2	0.01	0.045
Room 23	PC-3	0.01	0.029

The analytical report from AMA is contained in Appendix D

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft2)	Result (µg/ft2)	Maximum Surface Contamination Level (µg/ft2)
Lobby Foyer #1	1121-01	1.000	<12	200
Rear Storage #14	1121-04	1.000	65	200
Office #2	1121-05	1.000	14	200
Office #28	1121-13	1.000	540	200
Office #4	1121-14	1.000	43	200
Kitchen #18	1121-15	1.000	15	200
Classroom #17	1121-16	1.000	88	200
Blank	1121-12	NA	12 µg	NA

2.2.5 Asbestos

Damaged suspect asbestos-containing materials were observed throughout the armory. Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116). Table 2-4 below presents the results of the sample analysis.

Table 2-4
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Office #17	Pipe Insulation	ASB-1A	70% Chrysotile
Office #28	Pipe Insulation	ASB-1B	50% Chrysotile
Room #16	Pipe Insulation	ASB-1C	50% Chrysotile

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

ERGONOMICS: Overall office ergonomics were poor with computer work stations having fixed chairs, monitors and keyboards.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in the offices within the administrative area. URS recommends increasing lighting in the administrative areas through the use of task lighting.

LEAD: A lead wipe sample collected in Office #28 was above the 200 microgram per square foot limit set by the NGB Region North Industrial Hygiene Office (See Appendix G). This area should be cleaned by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 29 CFR 1926.62)

ASBESTOS: The identified damaged and/or exposed asbestos-containing materials need to be removed or repaired by a Commonwealth of Massachusetts licensed Asbestos Abatement Contractor. The material is located throughout the facility and totals about 100 linear feet of pipe insulation. This material also needs to be managed under an asbestos operations and maintenance plan.

MOLD: The water stains and damage on the ceilings and/or walls could lead to mold problems if not addressed.

HOUSKEEPING: Electrical panels should be free and clear of obstructions for at least 36 inches.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft2)	Result (µg/ft2)	Maximum Surface Contamination Level (µg/ft2)
Front	1121-06	1.000	220	200
Center	1121-07	1.000	1,700	200
Rear	1121-08	1.000	3,500	200
HVAC	1121-09	0.694	4,400	200
Light Fixture	1121-10	0.833	6,200	200
Metal Fixture	1121-11	1.000	3,600	200
Blank	1121-12	NA	12 µg	NA

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result (µg/m3)	OSHA's PEL (µg/m3)
Former Firing Range	PB-1	214	<14	50.0
Blank	PB-3	NA	<3.0	NA

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29

CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

Paint chips were collected where paint was peeling and sent to AMA for analysis. The paint chip collected from the floor of the bullet trap (red) contained lead in a concentration above the allowable limit of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 3-3 below shows the results of the lead paint testing.

Table 3-3
Levels of Lead in Paint Found in the Former Firing Range

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Former Firing Range #9 – Gray	PC-4	0.01	0.28
Former Firing Range #9 – Red	PC-5	0.01	0.59

The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Each of the six surface wipe samples collected in the former firing range was found to contain lead dust levels which exceeded the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix G). Guidelines

for the cleanup and rehabilitation of former indoor firing ranges are included in Appendix H.

Approximately 900 square feet of peeling lead-based floor paint is present in this area. Personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 1926.62) should stabilize this paint.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is used for unit formations and activities as well as for storing equipment. There is a concrete floor and the walls are constructed of cinder-block.

An exit sign light was not working at the time of the inspection.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft2)	Result (µg/ft2)	Maximum Surface Contamination Level (µg/ft2)
Drill Floor Front	1121-02	1.000	43	200
Drill Floor Rear	1121-03	1.000	54	200
Blank	1121-12	NA	12 µg	NA

One air sample for lead dust was collected in the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result (µg/m3)	OSHA's PEL (µg/m3)
Drill Hall	Pb-2	236	<13	50.0
Blank	Pb-3	NA	<3.0 µg	NA

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the Drill Hall were below the 200 micrograms per square foot limit set by the NGB Region North Industrial Hygiene Office (See Appendix G).

EMERGENCY EGRESS: An emergency light was not working at the time of the survey and should be repaired.

5.0 BOILER ROOM / BASEMENT AREA

5.1 Operation Description

The boiler room is a mechanical space which contains a furnace and associated piping. There is a concrete floor and the walls are constructed of cinder blocks. Damaged asbestos-containing pipe insulation was observed totaling approximately 20 linear feet.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents sampled.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: The identified damaged and/or exposed asbestos-containing materials need to be removed or repaired by a Commonwealth of Massachusetts licensed Asbestos Abatement Contractor. The material is located throughout the facility and totals about 20 linear feet of pipe insulation. This material also needs to be managed under an asbestos operations and maintenance plan.

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. No training records were found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection. No chemical inventory on site.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A written personal protection equipment program is not required for this site.

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

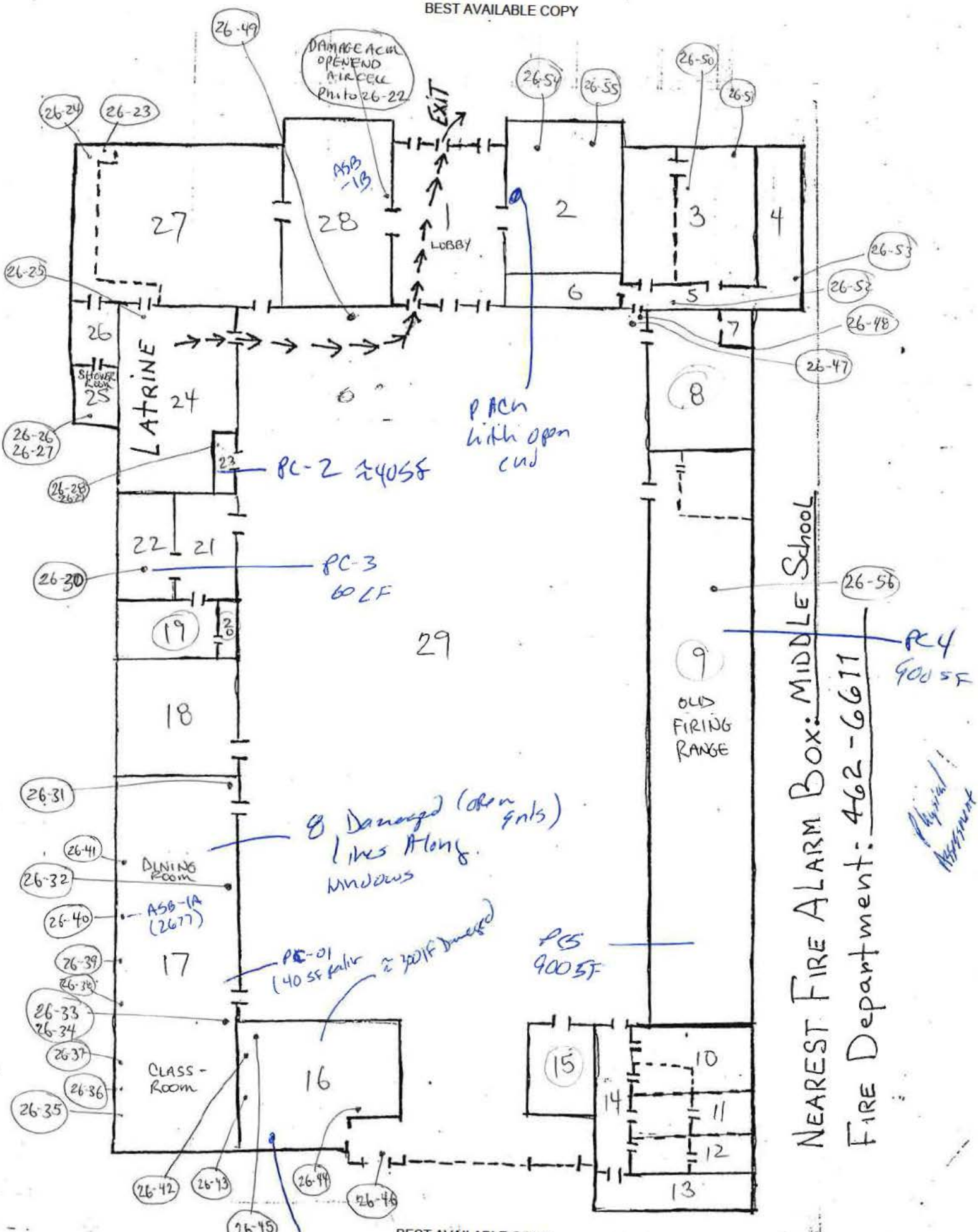
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

Standard for Construction Industry: 29 CFR 1926

APPENDIX A

ARMORY DRAWING



APPENDIX B

PERSONNEL LIST

PERSONEL LIST
NEWBURYPORT ARMORY

Name	Rank
Non-Responsive	SFC
	SFC

APPENDIX C

HAZARDOUS MATERIALS LIST

Hazardous

Penetrating 0.1 / Teflon
127-18-4
57018-52-7
124-38-9
64741-88-4
64742-52-5

Floor Finisher
52130-77-2
111-77-3
78-51-3
24-74-2

Rebound Cleaning / Polishing Compound
7732-10-5
111-77-3
5989-27-5
9016-45-9

Sludge Hammer
1310-73-2
1310-58-3

Shix-Em-Up
64742-88-7
91-20-3

Silicone Rubber 999-97-3

Spray Mist
111-90-0
74-98-6
75-28-5
106-97-8
64-17-5
620-63-7

UREA
57-13-6

Varnish Q
111-76-2
67-63-0

Wax Stripper 107-21-1

Weareder (wet look)
7732-18-5
28 263-96-9
68441-17-8
111-77-3
78-51-3

Misty Weed-a-cide
64742-94-5
67-56-1
140-18-0

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Hazardous

Non - Hazardous

Product	
Ammonia	1336 - 21 - 6
Air Aide Peach	67-63-0 106-97-8 75-37-6
Isopropyl Alcohol	67-63-0
AN Concentrate	111 - 76 - 2 111 - 42 - 2
Baseboard Stripper	1310 - 73 - 2 5589 - 27 - 5 6834 - 92 - 0 68476 - 85 - 7
Non-Acid Bowl Cleaner	139 - 08 - 2
Buff-up (Zep)	9016 - 45 - 9 67-63-0 34590-94-8
Cling It → (HCL Ammonia Chloride	7647-01-0) 7073-51-5
Calcium Chloride Pellets	10043-52-4
Image Carpet Shampoo	107-41-5

Anti-Bacterial Soap
Carpet Freshner
Citrus concentrate
Custom High Speed Maintainer
~~Devour~~
Furniture Polish
Hand cleaner
High-Speed Maintainer
Scouring powder

Hazardous

CiTrexx Degreaser
7732-18-5

Citrus Terpenes
5989-27-5
6067-30-7
9016-45-9

Grime Gobbler Cleaning Towels
64742-48-9
64-17-5

D-Stroy cleaner

Drain Cleaner
1310-73-2
1310-58-3

Dum Aid
64-07-8
26264-58-4

Dust Mop Treatment
8052-41-3
75-28-5
64742-54-7

Diamond Hard
62180-77-2
111-77-3
84-74-2

Earthquake Stripper

F-21 55D
79-01-6
127-18-4
124-38-9

Floor Finisher
1336-21-6
111-90-0
111-76-3
107-98-3
34590-94-8

Germicidal Foaming Agent
75-28-5
111-90-0
111-76-2
64-02-8

Glass Cleaner
111-76-2
64-17-5
67-56-1
68476-85-7

Zep - Antibacterial
2235-54-3
32612-48-9

Ice Melter Calcium Chloride
010043-52-4
007647-14-5
010476-85-4
007732-18-5
7447-40-7

Hazardous

Inuisilube
110-54-3
64742-65-0
106-97-8
74-98-6
75-28-5
8009-03-8

Liquid Bleach 7681-52-9

Liquid Lightning 1310-73-2
111-76-2
1336-21-6

Anti Freeze Coulant
107-21-1

CLP Liquid (Lubricant)
68037-01-4
64742-47-8
103-09-3

Gasoline 8006-61-9
78-00-2

Lube-0.1
64742-65-0

Lil' Awesome (Solvent)
7664-93-9
95-30-1

Mighty Clean
67-63-0
139-08-2

Misty Mop Treatment
8052-41-3
75-28-5
64742-54-7

Misty Glass & mirror Cleaner
111-76-2

No Mix TERG-O cide
111-76-2
111-90-0

One Shot
Air Freshener
Proprietary

Para-Dichlorobenzene Blocks
106-46-7

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APPENDIX D

ANALYTICAL RESULTS

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	URS Corporation	**Job Name:**	Newbury Port Armory	**Chain Of Custody:**	121051
Address:	5 Industrial Way	**Job Location:**	Newbury Port, MA	**Date Analyzed:**	12/05/2003
	Salem, New Hampshire 03079-2830	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	08-Dec-03
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0411983	1121-01	Flame	Wipe	****	1.000	12.00	ug/ft²	<	12	ug/ft²	
0411984	1121-02	Flame	Wipe	****	1.000	12.00	ug/ft²		43	ug/ft²	
0411985	1121-03	Flame	Wipe	****	1.000	12.00	ug/ft²		54	ug/ft²	
0411986	1121-04	Flame	Wipe	****	1.000	12.00	ug/ft²		65	ug/ft²	
0411987	1121-05	Flame	Wipe	****	1.000	12.00	ug/ft²		14	ug/ft²	
0411988	1121-06	Flame	Wipe	****	1.000	12.00	ug/ft²		220	ug/ft²	
0411989	1121-07	Flame	Wipe	****	1.000	12.00	ug/ft²		1700	ug/ft²	
0411990	1121-08	Flame	Wipe	****	1.000	12.00	ug/ft²		3500	ug/ft²	
0411991	1121-09	Flame	Wipe	****	0.694	17.28	ug/ft²		4400	ug/ft²	
0411992	1121-10	Flame	Wipe	****	0.833	14.40	ug/ft²		6200	ug/ft²	
0411993	1121-11	Flame	Wipe	****	1.000	12.00	ug/ft²		3600	ug/ft²	
0411994	1121-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Technical Manager: [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	121048
Address:	5 Industrial Way	**Job Location:**	Newburyport Armory, MA	**Date Analyzed:**	12/5/2003
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-012-201	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	08-Dec-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result			Comments
0411963	PC-1	Flame	Paint Chip	****	N/A	0.01	%Pb		0.11	%Pb	
0411964	PC-2	Flame	Paint Chip	****	N/A	0.01	%Pb		0.045	%Pb	
0411965	PC-3	Flame	Paint Chip	****	N/A	0.01	%Pb		0.029	%Pb	
0411966	PC-4	Flame	Paint Chip	****	N/A	0.01	%Pb		0.28	%Pb	
0411967	PC-5	Flame	Paint Chip	****	N/A	0.01	%Pb		0.59	%Pb	
0411968	Pb-1	Flame	Air	214	N/A	14.02	ug/m^3	<	14	ug/m^3	
0411969	Pb-2	Flame	Air	236	N/A	12.71	ug/m^3	<	13	ug/m^3	
0411970	Pb-3	Flame	Air Blank	0	N/A	3.00	ug/m^3	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

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4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Newport Armory	**Chain Of Custody:**	138358
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Newport M.A.	**Date Submitted:**	5/31/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	6/1/2005 **Report Date:** 01-Jun-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0542764	1121-13	Flame	Wipe	****	1.000	12.00	ug/ft²	540	ug/ft²	
0542765	1121-14	Flame	Wipe	****	1.000	12.00	ug/ft²	43	ug/ft²	
0542766	1121-15	Flame	Wipe	****	1.000	12.00	ug/ft²	15	ug/ft²	
0542767	1121-16	Flame	Wipe	****	1.000	12.00	ug/ft²	88	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	121048
Address:	5 Industrial Way	**Job Location:**	Newburyport Armory, MA	**Date Analyzed:**	12/5/2003
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-012-201	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Analyst ID	Comments
0411971	ASB-1A	70	70	--	--	--	--	--	10	--	--	20	Gray	LB	
0411972	ASB-1B	50	50	--	--	--	--	--	20	--	--	30	Gray	LB	
0411973	ASB-1C	50	50	--	--	--	--	--	20	--	--	30	Gray	LB	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples.

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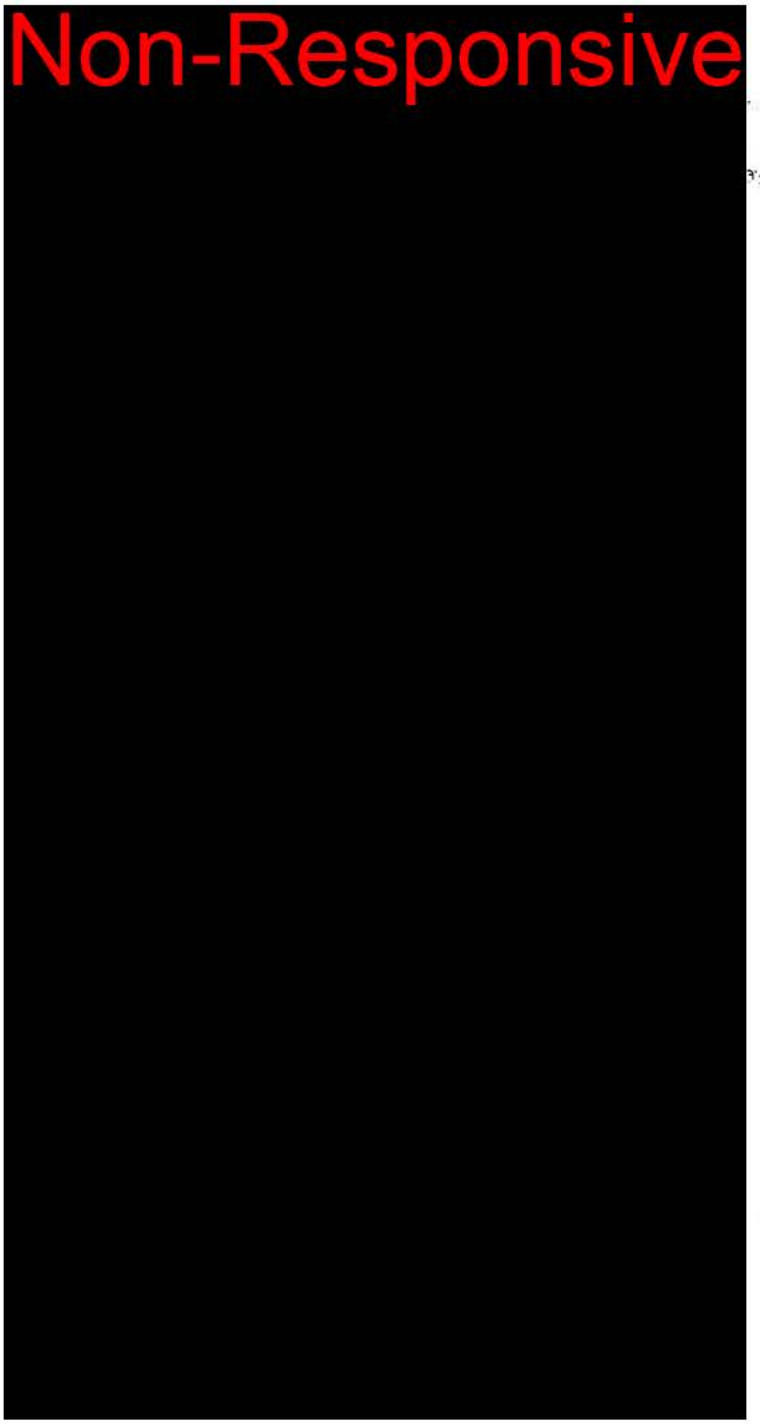
APPENDIX E

TRAINING CERTIFICATES

BEST AVAILABLE COPY



BEST AVAILABLE COPY

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

April 10, 2004
Expiration Date

03518010625349
Certificate Number

[redacted]
President/Director of Training

APPENDIX F

PHOTOGRAPHS

Photo 2620: Exterior View

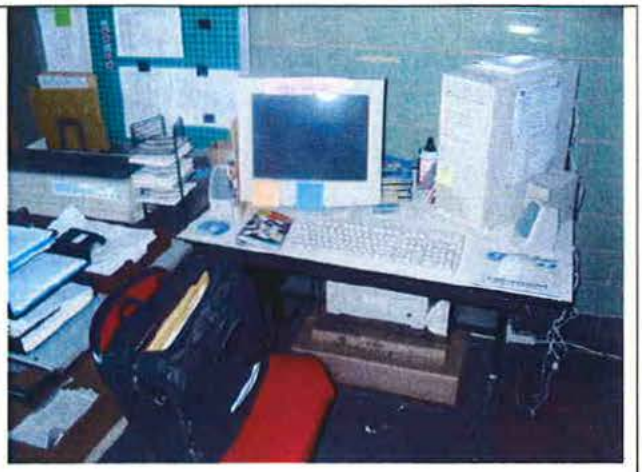


Photo 2621: Typical computer workstation with poor ergonomics

Photo 2622: Room 28 – Damaged asbestos-containing pipe insulation

Photo 2623: Room 28- Obstructed electrical panel

Photo 2624: Room 28 – Water damaged ceiling

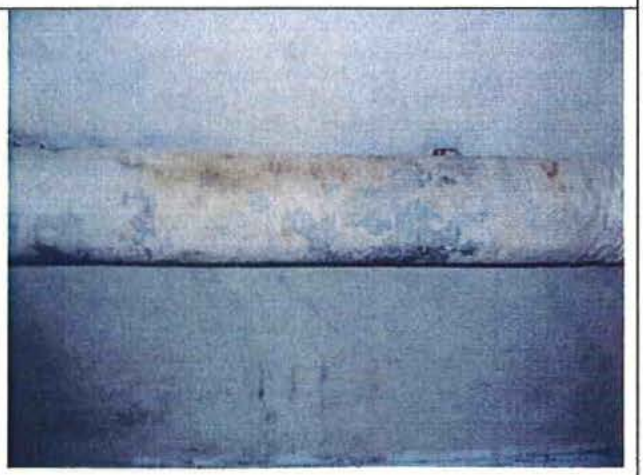


Photo 2627: Room 24 – Mold on fiberglass pipe insulation

Photo 2628: Room 23 – Damaged asbestos-containing pipe insulation in pipe chase

Photo 2631: Room 17 – Water damaged ceiling tile

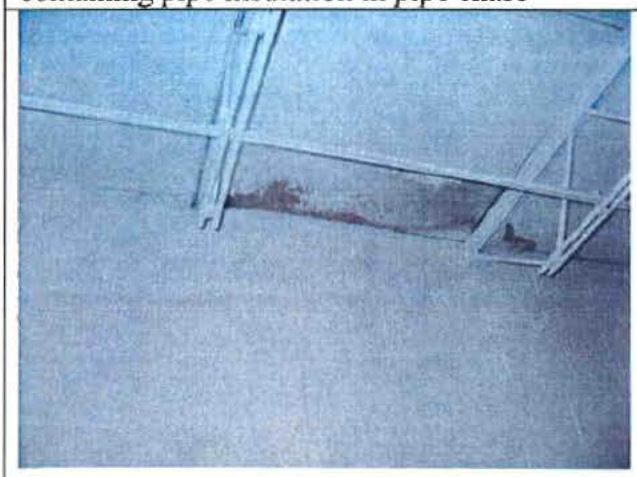


Photo 2632: Room 17 – Water damaged ceiling tile

Photo 2633: Room 17 – Water damaged ceiling tile

Photo 2634: Room 17 – Water damaged ceiling tile with mold on pipe insulation

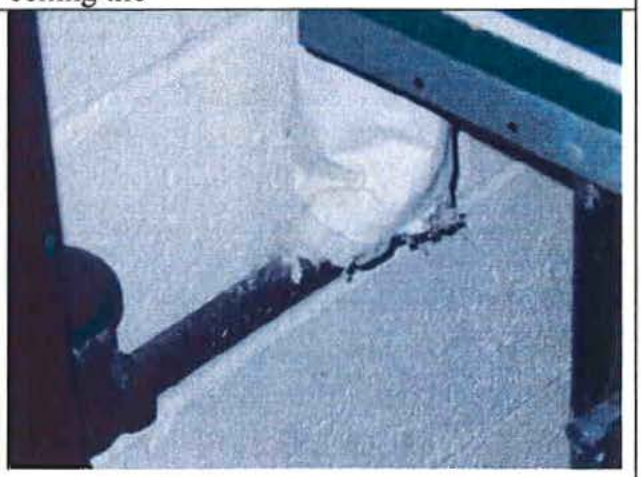


Photo 2637: Damaged asbestos-containing pipe insulation

Photo 2643: Boiler Room – Obstructed electrical panels

Photo 2644: Boiler Room – Open electrical panes

Photo 2645: Boiler Room – Damaged asbestos-containing pipe insulation

Photo 2646: Drill Floor – Exit light out (Light over rear door to exterior)

Photo 2647: Drill Floor – Water damaged ceiling

Photo 2649: Drill Floor – Obstructed electrical panel

Photo 2656: Former Indoor Firing Range – Red lead based paint (PC-5)

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)